Chatham District Fisheries Management Plan 1987 - 2000

DRAFT MANAGEMENT PLAN

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PREFACE

This draft fisheries management plan was prepared under the general context of the Chatham District Land Use Guidelines (MNR, 1983) and provides the long-term management direction (1987-2000) for both Great Lakes and inland fisheries within the Chatham administrative district.

The purpose of this draft management plan is to state fisheries management objectives and to detail specific strategies and tactics that will be undertaken within the planning period. To that end, the fisheries management plan is comprised of resource information, management strategies and the first five-year implementation schedule. The implementation schedule outlines the operational tactics designed to implement the management strategies.

During the public consultation phase leading up to the preparation of this draft management plan, a substantial amount of comment was received concerning the ability of the Ministry of Natural Resources to forecast fish yields into the future. The intentions of our fisheries management planning exercise with respect to future decisions can be summed up by the following:

> "It has been said that the greatest dilemma of mankind is that all knowledge is about past events and all decisions about the future. The object of this planning, long-term and imperfect as it may be, is to make reasonably sure that, in the future, we may end up approximately right instead of exactly wrong".
>
> (from Forest Production Policy Options, 1972 as reported in Baskerville, 1986)

The public is being asked to review this draft plan and to comment on the preferred management direction outlined there-in. Comments received will be considered in the preparation of the final management plan.

The final management plan will provide guidance to local fisheries managers as well as indicate future management direction to the public.

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1.0 INTRODUCTION

1.1 Purpose

The Chatham administrative district of the Ministry of Natural Resources (MNR) encompasses all of Essex, Kent and Lambton counties in extreme southwestern Ontario, a land area of 8,225 km^2 (Map 1). The Chatham District also includes an inland water area of 56.70 km^2 and a total of 7,055 km^2 of Great Lakes and interconnecting waters distributed over Lake Erie, the Detroit River, Lake St. Clair, the St. Clair River and Lake Huron.

The purpose of this draft fisheries management plan is to outline long-term fisheries management direction and to identify specific short-term (five-year) management activities to be carried out both on the Great Lakes and interconnecting waters system and on inland waters within the Chatham administrative district.

1.2 Planning Process

The Draft Chatham District Fisheries Management Plan was developed according to the Ministry of Natural Resources' integrated resource management planning system (MNR, 1986). Resource management planning is undertaken in order to solicit public input to the planning exercise, to ensure that programs and activities are integrated so that specific targets and objectives can be achieved, and to provide managers with direction on how to manage a particular resource.

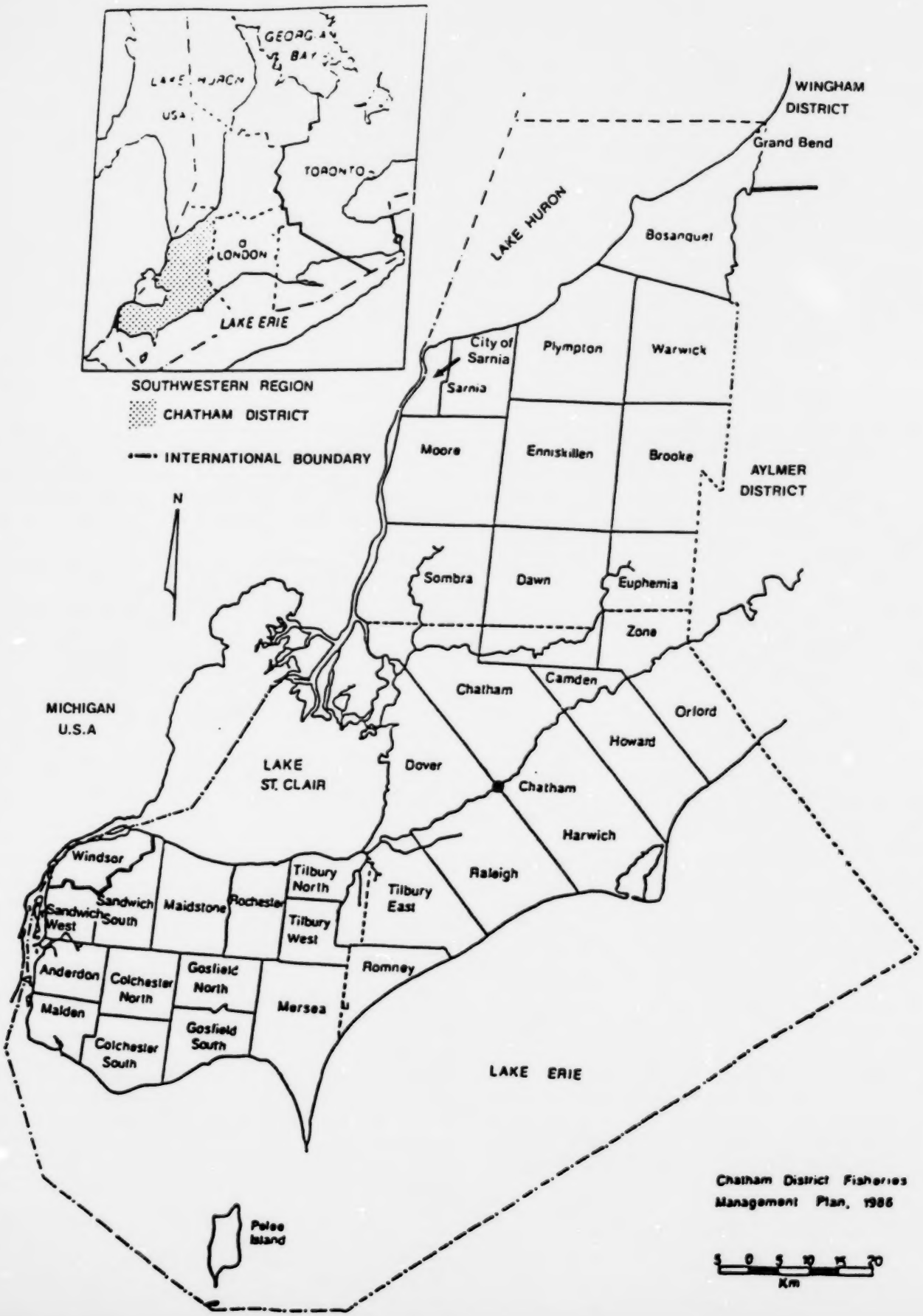
Within this system, a number of other resource management planning documents have jointly acted as an umbrella under which this Draft Chatham District Fisheries Management Plan has been prepared.

The Southern Ontario Coordinated Program Strategy (SOCPS) (MNR, 1982) provided general policies, guidelines and targets for resource management in the administrative districts within southern Ontario. The Chatham District Land Use Guidelines (DLUG) (MNR, 1983) defined resource management program guidelines, objectives and strategies that could be utilized within the Chatham District to achieve targets outlined in the Southern Ontario Coordinated Program Strategy.

The general policy framework, management principles, goals and objectives for fisheries management in Ontario originate from the task force on Strategic Planning for Ontario Fisheries (SPOF) (MNR and Environment Canada, 1976). Emerging from SPOF, the Lake Huron Strategic Fisheries Management Plan (MNR, 1986b) and the Lake Erie Strategic Fisheries Management Plan are being prepared to provide comprehensive lake-wide management strategies for individual administrative districts on each lake. These plans will supplement the direction provided by the District Land Use Guidelines.

In addition, an earlier international planning exercise conducted by the Great Lakes Fishery Commission (GLFC) was completed in 1981 with the adoption by Canada and the United States of the Joint Strategic Plan for the Management of Great Lakes Fisheries (GLFC, 1980). This international plan established a common goal for Great Lakes fisheries management and recognized the issues, strategies and procedures to be followed to that end. All of the fisheries planning activity in Ontario is consistent with this plan.

MAP I CHATHAM ADMINISTRATIVE DISTRICT



Complementing the fisheries management planning process is the recently approved Chatham District Enforcement Plan (MNR, 1986c). As a valuable tool of resource management, planned enforcement is critical to the attainment of ministry management objectives.

Within the framework of these documents, the Draft Chatham District Fisheries Management Plan has been prepared. This management plan provides details on specific management strategies and tactics formulated to achieve local fisheries targets. To that end, the fisheries management plan includes an implementation schedule which outlines tactics required to fulfill fisheries management objectives over the next five-year period. Annual fisheries work plans will be formulated in accordance with this implementation schedule.

1.3 Policy Background and Technical Direction

Spawned from the integrated resource management philosophy, the Draft Chatham District Fisheries Management Plan is consistent with current Ministry of Natural Resources policies. The integrated resource management approach coordinates resource management programs so that benefits are maximized and conflicts are minimized. This philosophy is vital to fisheries management since other programs have direct impacts on local fisheries.

This management plan only highlights many of the background studies and analyses undertaken during the preparation of this plan. These documents are available at the ministry's Chatham District Office and include:

(i) Terms of Reference (Duckworth, 1986) - provides a detailed account of the planning process required to complete the fisheries management plan;

(ii) Fisheries Background Information (Duckworth, 1986) - describes the fisheries resource, resource use, problems and issues facing these resources and details present fisheries management practices;

(iii) Summary of Background Information and Optional Management Strategies (MNR, 1986) - a summary of the background information document which identifies, evaluates and selects management options for public review.

NOTE: This was the document that was circulated for public review in December, 1986 and January, 1987;

(iv) Summary of Background Information Open House (Duckworth, 1987) - a summary and evaluation of the first public open houses on problems/issues and optional management strategies;

(v) Summary of Questionnaires and Public Response (Duckworth, 1987) results of public comment on the background information/optional management strategy phase of the planning process.

2.0 DISTRICT FISHERIES PERSPECTIVE

2.1 The Fisheries Resource

The fisheries resource in the

Chatham District is rich both in terms of its productivity and its diversity. At least 140 fish species are known to exist within the waters of Lambton, Kent and Essex counties.

The prevailing importance of the three major lakes is a major feature of the Chatham District. This includes 97,000 hectares of Lake Huron, 80,000 hectares of Lake St. Clair and 586,500 hectares of Lake Erie (Map 2).

Lake Huron is the only lake in Chatham District with significant amounts of deep, coldwater habitat that compliments the warmwater/ coolwater habitat found in inshore areas. Accordingly, fish species present include coldwater lake whitefish, chinook salmon and rainbow trout, chub and freshwater cod, as well as fish preferring the warmer inshore waters such as walleye (yellow pickerel), yellow perch, smallmouth bass and panfish.

Lake St. Clair is shallow throughout and provides habitat for a diverse array of warmwater species. Carp, freshwater drum, walleye, channel catfish, panfish, suckers and yellow perch are predominant. The marshes of Walpole Island on the northeastern shore of the lake as well as the eastern shore marshes provide important spawning and rearing habitat for many of the resident warmwater fish species. Those species of primary importance include yellow perch, northern pike, largemouth bass and sunfish. The Thames River is a major tributary to the lake and is the principal spawning run for walleye from Lake St. Clair. Large numbers of walleye from the St. Clair River and lower Lake Huron also use the Thames River for spawning purposes.

The Chatham District-administered portion of Lake Erie includes all of the Ontario portion of the western basin, an area of 171,500 hectares located entirely in Essex County, and the Kent County portion of the central basin, a vast area of 415,000 hectares. The western basin has a typical warmwater environment with shallower water, higher nutrient levels and a greater fish productivity per unit area. By comparison, the central basin habitat conditions offer greater depths, cooler water, lower nutrient levels and lower fish productivity per unit area. The fish communities in the two basins differ in their population densities. There are higher densities of a number of the economically important species such as yellow perch, walleye, and white bass in the western basin. Also, the cooler central basin waters are preferred by smelt and salmonids.

Almost completely cut-off from Lake Erie proper, Rondeau Bay is a shallow 2,700 hectare embayment which provides habitat more similar to Lake St. Clair than the adjoining central basin of Lake Erie. Although presently in a degraded condition, it offers habitat to a fish community characterized by yellow perch, black crappie, channel catfish, northern pike, white perch and largemouth bass.

The St. Clair and Detroit Rivers are interconnecting channels which act as migratory corridors for a number of fish species including walleye, white bass, white sucker, channel catfish and black crappie. These rivers allow fish to move from one critical fish habitat to another, thereby ensuring the maintenance of their life history processes.

The dominant species in the adult fish community of the St. Clair

River include rock bass, yellow perch and walleye. The Detroit River fish community is dominated by rock bass, yellow perch, white perch and walleye.

Five major watersheds drain the Chatham District. Soils found within these watersheds are primarily clay with some areas having soils with a sand base. The underlying geology is mainly sedimentary bedrock composed of shale, sandstone, limestone and dolomite.

There are 103 warmwater rivers, streams and drains distributed over the five watersheds within the planning area. These watercourses have a total length of almost 2,000 kilometres and a surface area of 2,970 hectares. None of them is known to support coldwater fish although chinook salmon are known to attempt spawning during the fall in a number of streams tributary to Lake St. Clair and Lake Huron. Although sport fish species such as walleye, smallmouth and largemouth bass and northern pike are found at low resident population levels in 40 of the 103 watercourses, they are usually not sufficiently abundant to support an angling fishery. The dominant fish species in these watercourses are usually coarse fish (suckers and carp), panfish and small-bodied minnow or other species.

There are no inland lakes in Chatham District. However, there are numerous privately owned land-locked farm ponds/gravel pits which, for the purpose of this plan, are not considered to contribute to the fisheries resource.

There are eight fish species in Chatham District which are officially considered rare in Canada, namely: spotted gar, spotted sucker, silver chub, pugnose shiner, pugnose minnow, central stoneroller, brindled madtom, and the blackstripe topminnow. The native blue pickerel is now extinct.

The strong buffering capacity inherent in the soils insulates the fisheries from the possible effects of acid rain. The high mineral content of the soils imparts this characteristic to the receiving waters and provides the basis for a productive fishery. In the absence of aquifers or springs reaching the surface, virtually all inland surface waters are classed as warmwater systems and are incapable of supporting salmon or trout year-round. Selfsustaining populations of these species cannot presently be maintained within the Chatham District as a result of these temperature limitations and the lack of quality inland spawning areas.

Water quality and warmwater fisheries habitat, especially for inland areas, have been severely altered by the presence of high suspended solid loads and turbidities. This situation has been caused by excessive erosion from the intensively farmed land and highly developed drainage schemes which have altered the natural habitat in most of the inland streams within the district.

The Great Lakes shoreline marshes have become increasingly less accessible to fish species which normally rely on them for spawning, rearing young or feeding. This has occurred through the development of a highly engineered shoreline for the purposes of flood and erosion protection. As a result, present-day production levels of marsh-dependent species may be lower than historical levels.

2.2 Current Potential and Projected Fish Yields

Current potential and projected fish yields for each of the five waterbody categories are presented in Table 2.1. No yield estimates are available for the Detroit and St. Clair Rivers. These projected yield figures are divided down to the species and species assemblage allowable yield levels in Appendix 1. Depending on the source waterbody, fisheries yields were based upon a variety of factors including long-term sustained harvests of target species, ecologically derived conversions from estimates of the forage base, and application of previously determined yield/hectare productivity estimates.

Current potential annual warmwater fisheries yields are estimated to be 8,016,000 kilograms. With rehabilitation of the Lake St. Clair bluegill-pumpkinseed populations and the largemouth bass-crappie-sunfish populations of Rondeau Bay, the projected warmwater fisheries yield is expected to reach 8,040,070 kilograms by the year 2000.

During the initial public consultation phase of this planning process, it became apparent that a re-examination of Lake Huron whitefish yield figures was necessary since recent harvests have greatly exceeded the theoretical estimates of whitefish yield. Those yield figures were based on a rehabilitated resource with similar species and levels of species abundance that occurred prior to the decline in lake trout and associated species.

Since rehabilitation of the top predator community in Lake Huron will not be complete until well into the next century, it is recognized that whitefish yields will remain higher in the interim. Consequently, the estimated potential yield of whitefish has been revised to more accurately reflect the species' present level of abundance and sustained yield until 2000. It should be recognized, however, that as management actions are undertaken to rehabilitate the lake, whitefish abundance may decline and long-term yields (25-50 years) will possibly more closely approximate historic levels.

Due to the relatively small amount of salmonid habitat and associated production within the Chatham District waters of Lake Huron, it is likely that the expanding chinook salmon harvest by the sport fishery in this area, although supplemented by stocking from the Bluewater Anglers' Hatchery, will be heavily dependent upon fish production elsewhere.

These yield figures can be equated to represent long-term average harvests. In any given year, actual harvests, including quotas in the commercial fishery, may rise above or fall below these yield levels. The naturally cycling highs and lows in fish populations necessitate that the fisheries management program remains dynamic and sensitive to these short-term changes in fish populations.

2.3 Present and Anticipated Future Uses

An estimate of current angling activity is available from the many on-the-water creel census programs that have been conducted on most of the major angling fisheries in the district. These results were factored upward to include unsurveyed areas and time periods providing an annual estimate of 351,820 angler days, with Ontario residents accounting for 203,562 angler days or 58 per cent and

Table 2.1 Current Potential and Projected[4] Theoretical Annual Fish Yields[1], By Community Type From Chatham District Waters, 1987-2000.

	FISH COMMUNITY					
	COLDWATER	WARMWATER	COARSE	BAIT-FISH	UNRECORDED	TOTAL
Lake Erie[2]						
Current and Projected	10.00	7,547.50	1,012.5	45.00	592.0	9,207.00
Lake St. Clair[2]						
Current	-	265.35	340.20	2.27		607.82
Projected	-	272.61	340.20	2.27		615.08
Lake Huron[3]						
Current and Projected	249.92	191.84	37.20	12.80		491.76
Rondeau Bay[2]						
Current	-	11.30	1.74	-		13.04
Projected	-	28.12	2.17	-		30.29
Warmwater Rivers and Streams[2]						
Current and Projected	-	-	87.63	1.46		89.09
Total						
Current	259.92	8,016.00	1,479.27	61.53	592.0	10,408.71
Projected	259.92	8,040.07	1,479.70	61.53	592.0	10,433.22

Legend:

[1] Expressed in thousands of kilograms.

[2] Values are from the background information document.

[3] Includes a revised allowable yield estimate for lake whitefish in lower Lake Huron.

[4] Projected yield represents an increase over current yield for those waters where rehabilitation efforts are anticipated.

non-residents 148,258 angler days or 42 per cent. This angling activity is known to generate substantial economic value although estimates of the dollar value are not presently available. In addition, recreational smelt fishing on Lake Erie waters is estimated to account for 38,403 smelt fishing days.

Annual projected use to the year 2000 can be estimated by applying an expected 15 per cent increase to the present use levels. Accordingly, 404,593 angler days and 44,165 smelt fishing days are anticipated.

These estimates are considered to be conservative. Information from the 1980 provincial angler survey reveals that Chatham District ranks first in the southwestern region and second in Ontario in terms of both resident and non-resident angling effort. Generally, the waters in Chatham District are renowned for their high quality warmwater fisheries (walleye, perch and bass) which presently supply the bulk of these angling opportunities within southwestern Ontario.

A detailed description of potential fish yields and the associated resource use for the five waterbody systems in Chatham District is provided in both fisheries management planning background information documents (Duckworth, 1986b; MNR, 1986d). Based on the present understanding of available supply and projected sport fishing demand, all of the five waterbody systems appear to be able to meet this demand. In particular, surplus warmwater sport fish production (walleye) is believed to exist for the Lake Erie and Detroit River system. As discussed previously, the establishment and possible expansion of the Bluewater Anglers' Hatchery chinook salmon stocking program will produce a demand for coldwater species (salmon) which will exceed the capability of Chatham District waters to supply. This will likely result in a reliance on fish production from waters outside the Chatham administrative district.

Theoretically, surplus fish production exists and is projected to exist to 2000 for the inland waters system. Most of this surplus is presently dominated by coarse fish species, and this situation will continue. It does not appear feasible to sufficiently rehabilitate the habitat of warmwater rivers and streams in order to bring about game fish production to a level that would substantially increase sport fishing opportunities for preferred species. The warmwater rivers and streams in the Chatham District may be able to accommodate possible latent demand in the sport fishery for coarse fish species.

The Chatham administrative district currently issues 162 commercial (food) fishing licences for activity on Lake Erie, Lake St. Clair and Lake Huron. The commercial fishery within Chatham District is the most important one in Ontario, both in terms of weight and dollar value of the landed catch. During 1986, the commercial fishery harvested 9,178,126 kilograms for a landed value of $27,792,870. When the export value is considered, the economic value of the commercial fishery is several times greater. Using an economic conversion factor of 3.2 (Talhelm, 1987), a real value of about $89,000,000 is indicated. Lake Erie accounted for 92.6 per cent of this harvest with Lake Huron and Lake St. Clair contributing 7.2 per cent and 0.2 per cent respectively.

With the adoption of the "Modernization of the Commercial Fishery"

program in 1984, it was confirmed that no new commercial fishing licences would be issued.

Actual harvests will vary as quota management is used, on an annual basis, to maintain viable fisheries within the realities of naturally fluctuating fish populations. It is unlikely that the 1986 quota levels for a number of major commercial species can be sustained over the long-term.

Each year about 139 bait-fishing licences are issued and are associated with a harvest of 1.5 million dozen bait-fish valued at approximately $250,000. Projected demand for bait-fish is expected to parallel increases in the angling activity within Chatham District waters and within the American jurisdictions where bait-fish harvested from Chatham District waters are marketed.

2.4 Non-Fisheries Data

In addition to basic fisheries information, a substantial amount of other information must be considered in the formulation of a fisheries management plan.

Drainage schemes, often involving dams and pumps for water level control, have altered fish habitat and restricted fish movement both within streams and between streams and receiving major waterbodies.

Other land-use practices, such as intensive cash crop agriculture, deforestation, wetland reclamation, poor agricultural practices, aggregate extraction and urban and recreational development may have significant adverse impact on the district's fisheries. Pollution sources, whether agricultural, municipal or industrial, can impair water quality and/or fish habitat and result in reduced potential fish yields.

2.5 Concerns and Issues

The background information document distributed to the public in December, 1986 and January, 1987 identified and described twelve concerns and issues which confront fisheries management programs. The public consultation phase following the release of the summary document entitled Background Information and Optional Management Strategies (MNR, 1986d) confirmed the reality of these concerns and issues and provided an indication of the importance that different resource users attach to each of these problems and issues.

These concerns and issues can be condensed to fall within five categories:

(i) Reduction of Habitat, Fish Populations and Opportunities

Fish habitat degradation is known to have a negative impact on fish populations and may cause the loss of fish populations and fishing opportunities.

In Chatham District, habitat reduction occurs in a number of ways. High intensity agricultural land-use practices have severely degraded most inland fisheries habitat and water quality to a point where the cost of rehabilitation is potentially very high and involves application of soil conservation and review of drainage procedures across whole watersheds. The presence of this agricultural pollution coupled with industrial and other municipal pollution sources along the Great Lakes waterways within the district continues to threaten water quality and fish habitat when effluent disposal is conducted contrary to existing legislation. Great Lakes shoreline marshes and inshore fisheries habitats

have been reduced by the combined impacts of poor water quality, inflows from inland watersheds, high water levels, dyking and developments along shorelines.

Other possible causes for the declines in fish populations include over-harvest, illegal harvest, introduction of some non-native species and the vulnerability of populations of rare fish to be threatened with extirpation.

Based on the per cent composition of the total district fish harvest by weight (commercial fishery 87%, sport fishery 13%), the potential for negative impact is greater with the commercial fishery. Although present commercial fish quotas are not likely to be sustained over the long-term, it is the intention of both the industry and the ministry that quotas will be managed to reflect fish availability through annual operation of the quota harvest control system. A continued responsible adherence to this harvest control system by the industry and the ministry will ensure the existence of viable commercial fisheries and healthy fish populations into the future. A well-founded and credible harvest control system is critical in order to allay the concerns expressed by many during the first public consultation phase with respect to the extent and volume of the commercial fish harvest.

Illegal harvests can compromise intensive management efforts to sustain and/or rehabilitate fish populations. Concern for illegal activity and harvest was identified as a major problem during the first public consultation phase in which many people asked for more enforcement of both the sport and commercial fisheries. The proven value of the modernization of the commercial fishery program and the "self-policing" initiative in western Lake Erie by the industry in curtailing illegal harvests cannot be understated. It is apparent that enhanced enforcement of the sport fishery is also required in order to curb incidents of illegal activity and harvest in that fishery.

Although it has not been documented, introduced species such as chinook salmon may possibly be responsible for the reduction in inshore yellow perch populations in Lake Huron. This theory was strongly advocated by a number of concerned users during the public consultation phase and is worthy of study. In addition, much concern was expressed about the impact that the expanding white perch populations are having on native species such as yellow perch, especially in Lake Erie and Lake St. Clair.

It was interesting to note that while there are eight fish species which are rare and may become threatened with extinction, most respondents during recent public consultation felt that this situation is of lower importance than many of the other candidate concerns and issues. This opinion reflects a general lack of interest with the inland fisheries resource where most of these rare species are known to live. It also demonstrates a tendency for anglers or commercial fishermen to be more concerned with sport or commercial fish species rather than with the rare species which are not found in either of these two groupings.

As fishing opportunities are clearly contingent on fish being available, the reduction in or the loss of fish populations will reduce fishing opportunities for both sport and commercial users. Restricted access to the fisheries resource will also reduce opportunities. However, this specific issue, although considered important by forty-eight per cent of the sport

fishermen, ranked last relative to the perceived importance of the other eleven issues.

(ii) Lack of Public Awareness and Incomplete Knowledge

Lack of awareness by the public of key fisheries issues causes many private interests to be insensitive to potentially damaging activities. It can also lead to a situation whereby fisheries user groups may put unrealistic demands on the fisheries resource that can exceed its capabilitites and reduce the benefits accruable to other users.

Knowledgeable interest groups will be able to increase their contribution to co-operative fisheries projects with the ministry and will more clearly see the way to resolving conflicts among themselves. In the future, the attainment of all fisheries targets will be predicated by a strong working arrangement between the ministry and all user groups, characterized by mutual understanding and open communication channels. Based upon the written responses received from the public as well as the awareness level demonstrated at the open houses, an enhanced public information program is warranted.

The concern of incomplete scientific knowledge in fisheries management was a prime concern for representatives of the commercial fishing industry. The ministry's ability to assess fish population levels and decide upon allowable yield levels is recognized as one area for improvement by both the ministry and the industry. Initiatives like the independent review of the Lake Erie fisheries assessment program conducted during late 1986 are means by which the concern of incomplete scientific knowledge can be given some focus.

Another area that became quite topical during the public consultation phase is the impact of species interactions (particularly non-native with native) on long-term stability in the fish community. Fish community interactions involving white perch and salmonids must be evaluated so that knowledgeable management decisions can be made and the targets for bait-fish, commercial fish, sport fish and rare/endangered species can be realized.

Lack of information about the fishing activities of native persons does not preclude a viable fish management program but it does prevent the fine tuning of the program so that maximum benefits are accrued to all users. This issue was accredited with having a significant importance during the public consultation phase, especially by commercial fishing interests.

(iii) Managing Fish Species of Common Concern Across Jurisdictions

The Lake Erie-Lake St. Clair-Lake Huron system within Chatham District also fronts on two American states, Ohio and Michigan. Management philosophies can differ across these jurisdictions. Population management activities undertaken within one political boundary can have far-reaching impacts on adjacent and often more distant jurisdictions.

Fish species such as walleye can spawn within one jurisdiction but their survival may be determined by decisions made within another jurisdiction.

It is important that neighboring agencies work co-operatively to ensure that the fish populations of common concern are not reduced and that respective fisheries management targets are met.

During the public consultation phase this issue was ranked very high in importance compared to the other eleven candidate concerns and issues. However, it did demonstrate that the fisheries resource user is extremely aware of the Great Lakes setting of Chatham District, its proximity to other jurisdictions and the migratory character of some of the more important fish species.

(iv) Conflicts Between Resource Users

The public consultation phase served to highlight this concern above almost all others. It became apparent that these conflicts are often based on perceptions rather than fact. A level of trust and understanding needs to be reached between the sport and commercial fishermen in particular. It was clear that members of each group were not fully informed of the concerns of the other. A greater exchange of ideas and information between the two groups is needed. A stronger communication link and some accommodation of each other's interests will foster mutual respect and a reduced tendency to assume an adversarial approach. As a starting point, the actual timing and placement of fixed commercial gear (nets) seems to be a particular irritant to boaters. This situation should be looked at by both groups and the ministry to try to ensure a better mutual co-existence.

Responses at the open houses clearly indicate that conflicts can exist within a user group. In particular, a strong push for the management of salmon by some sports fishermen was countered by other anglers who prefer management of native and naturalized fish species.

(v) Under-Utilization of Fish Resources

The under-utilization of fish resources can be regarded as an obstacle for obtaining optimal benefits from the resource that can come about for several reasons.

Firstly, there is a large supply of under-utilized fish species in the Chatham District which is not matched by demand. Neither anglers nor commercial fishermen are fully utilizing the carp, freshwater drum or white perch in Lake Erie, Lake Huron or Lake St. Clair. Other unwanted species include suckers in Lake St. Clair and Lake Huron, bowfin in Lake St. Clair and freshwater cod and gizzard shad in Lake Huron. In inland waters carp, freshwater drum, suckers and bullheads are generally not sought by anglers.

Secondly, and probably more importantly (based on comments from the public consultation phase), full utilization of sport and commercial fish is reduced or absent in some areas because of the presence of high levels of contaminants which can cause restrictions on the amount and size of fish for human consumption. Concern about contaminants was noted by several attendees at the open houses and reflects a general and increasing awareness and sensitivity about environmental issues in society. High levels of contaminants have an obvious effect on fishing activity and may also be influential in determining the physiological health of the fish themselves. The trends in the levels of contaminants in fish can be used as a barometer of how well the environmental regulations on effluent-producing industries are affecting the reduction

and control of contaminant sources. It is encouraging to note that all the levels of monitored contaminants are declining in all waterbodies.

Given the great demand for fish in Chatham District, a complete management program should give strong consideration to reducing the amount of under-utilization of fish resources.

3.0 MANAGEMENT DIRECTION

3.1 General Fisheries Management Objectives

The general goal of the Ministry of Natural Resources is to provide opportunites for outdoor recreation and resource development for the continuous social and economic benefit of the people of Ontario and to administer, protect and conserve public lands and waters.

The objectives of fisheries management in southern Ontario are to provide opportunities for recreational fishing and to realize economic benefits derived from commercial and bait fisheries consistent with the maintenance of healthy fish communities. (MNR, 1982)

Consistent with the above objectives, the fisheries management program in Chatham District will operate within the following set of fisheries principles:

* greater benefits can be provided by managing balanced fish communities consisting of native or naturalized self-sustaining stocks;

* water quality and fish habitat must be maintained if fish populations are to become stable and self-sustaining;

* a variety of users will be permitted to harvest fish stocks at levels consistent with allowable biological yields.

Within the context of the above principles, a number of specific objectives and targets have been determined for the fisheries in Chatham District. These are consistent with the more general principles but reflect demands of the local commercial, recreational and bait-fish fishermen as well as the ability of district fish resources to meet that demand. Targets that were established in the Chatham District Land Use Guidelines have been refined on the basis of updated calculations prepared for the background information document as well as input received during the public consultation phase. To ensure that the objectives will be realized, long-term management strategies and tactics have been formulated.

The MNR-funded community fisheries involvement program (CFIP) has been a successful, expanding program throughout Ontario since 1982. In co-operation with ministry technical and professional staff, volunteers have worked thousands of hours on a variety of projects to improve fishing in their areas. The future role of CFIP in fisheries management is currently under review so that changes may occur which will affect strategies and tactics in the future.

Within the geographic area of Chatham District there are four Indian reserves: the Walpole Island Reserve, Moravian Indian Reserve No. 47, Sarnia Indian Reserve No. 45 and the Kettle-Stoney Point Reserve. Future negotiations concerning native groups and fisheries management may affect the directions currently in this plan.

Strategies and tactics will differ according to the waterbody and the type of fishery.

For the recreational fishery, strategies and tactics are listed according to coldwater and warmwater fish community designations.

Selected strategies and tactics for the first five-year period (1987-91) are presented in the Implementation Schedule, Section 4.0.

3.2 SPECIFIC FISHERIES MANAGEMENT OBJECTIVES, TARGETS AND STRATEGIES

3.2.1 SPORT FISHERIES

Objective

To meet the projected demand within the limits of a wisely managed and rehabilitated resource.

Targets

The sport fishing target is to provide 400,240 angler days annually by the year 2000. This target is substantially different from the target of 905,500 angling opportunities that was identified in the Chatham District Land Use Guidelines as the target is based on actual projected use, not what the fisheries resource is capable of supporting.

The associated harvest target is to provide a sport fish yield of 381,472 kilograms annually by 2000. The fishery will be managed in order to maintain the current angling quality standard of 0.95 kilograms per angler day. The total district sport fish yield target is partitioned as to waterbody and fish community type and is shown in Table 3.2.

Discussion

At present, Chatham District offers a very high quality warmwater angling experience. Generally, the targets for sport fish can be reached within the present capability of the resource. Rondeau Bay as an under-producing waterbody is an exception to this and will have to be rehabilitated before its specific target, based on largemouth bass and sunfish, can be attained.

The target for the warmwater rivers and streams is set quite low and reflects the intended management direction of maintaining the status quo for these waterways.

The warmwater fishery in the Lake Erie-St. Clair-Lake Huron system is based primarily on walleye which comprises 63 per cent of the harvest. Yellow perch accounts for nine per cent and the smallmouth and largemouth bass assemblage at 6.5 per cent. These relative percentages will remain intact when the target for the warmwater fishery is reached.

Lake Erie is expected to provide the majority (approximately 86%) of the warmwater sport fish target on the basis of its productive summer walleye fishery and the substantial recreational smelt fishery during the spring.

Management of the warmwater sport fisheries will be conducted as follows:

- the warmwater fisheries will be managed on a self-sustained basis;
- Lake Erie, the Detroit River, Lake St. Clair, the St. Clair River and the nearshore waters of Lake Huron will be managed as percid fish communities with the top predator being walleye;
- by the year 2000 there will be no commercial fishery on Lake St. Clair except where conditions in the fish community warrant coarse fish removal;

Table 3.2 Annual Sport Fish Harvest Targets[1] to the Year 2000 by Community Type From Chatham District Waters

	FISH COMMUNITY			
	COLDWATER	WARMWATER	COARSE	TOTAL
Lake Erie and the Detroit River	6.0	162.1	10.2	178.3
Lake St. Clair and the Thames River	-	131.5	2.5	134.0
Lake Huron and the St. Clair River	26.1	20.6	-	46.7
Rondeau Bay	-	12.5	-	12.5
Warmwater Rivers and Streams	-	-	10.0	10.0
Sub-total	32.1	326.7	22.7	381.5
Lake Erie Smelt Fishing		826.0		826.0
Total	32.1	1,152.7	22.7	1,207.5

Legend

[1] In thousands of kilograms.

- Rondeau Bay will be rehabilitated to allow the dominance of the centrarchid fish community to return with largemouth bass being one of the top predators;

- inland waters will be managed to continue to provide spawning and nursery habitat and maintain existing sport fisheries.

The coldwater fishery is projected to account for less than five per cent of the total Chatham District sport fish target. Presently, based primarily on stocked fish and with little likelihood of natural reproduction occurring, this fishery is directly dependent on artificial management techniques.

While chinook salmon and rainbow trout are the main coldwater species in lower Lake Huron and the St. Clair River, coho salmon and rainbow trout support a limited coldwater fishery in Lake Erie.

Management of the coldwater sport fisheries will be conducted as follows:

- Pacific salmon will not be stocked into the Ontario waters of Lake Erie;

- coldwater sport fisheries for rainbow trout and chinook salmon will be managed for in lower Lake Huron and the St. Clair River to the extent that they do not preclude a viable commercial fishery in Lake Huron for other species nor create detectable resultant declines in the associated warmwater sport fishery;

- limited stocking of rainbow trout in the central basin of Lake Erie will be permitted to provide a local artificial fishery;

- options to rehabilitate lower Lake Huron with a salmonid top predator (like lake trout) will be left open so as to remain consistent with the Lake Huron Fisheries Management Plan.

Great Lakes waters will continue to supply the bulk of the sport fishing opportunties up to 2000. While substantial allowance for meeting latent demand beyond what is projected exists in the Lake Erie walleye sport fishery, the ability to achieve the smelt fishing target is predicated on improved management of this species. In addition, by realizing the desired sport fish production from Rondeau Bay, it is anticipated that sport fish targets can be achieved.

Strategies and Tactics

Fisheries management strategies have been refined from those outlined in the Chatham District Land Use Guidlines and represent long-term direction to 2000.

The following strategies and their associated tactics have been selected for each fish community to aid in the achievement of sport fish targets:

3.2.1.1 Warmwater Fisheries

(i) Stabilize the Lake Erie Smelt Population:

* investigate the possibility of controlling the harvest of smelt by sport fishermen;

* conduct a creel census type survey of the Lake Erie smelt sport fishery once every five years;

* reduce predatory stress on smelt by negotiating for lower salmon

stocking rates with United States' jurisdictions.

(ii) Increase production from existing fisheries:

* enhance fish habitat in Rondeau Bay by supporting Ontario Ministry of the Environment (MOE) and Ontario Ministry of Agriculture and Food (MAF) efforts to reduce soil erosion within the Rondeau Bay watershed;

* improve fish habitat in Rondeau Bay by fully evaluating the artificial reefs presently in place and extend this practice if it is proven to be beneficial for fish production.

(iii) Identify and evaluate fish habitat:

* survey and map spawning and nursery habitat and determine its significance for each important sport species from all major water bodies;

* evaluate areas on the Sydenham River where there is potential to rehabilitate walleye spawning sites once water quality has improved.

(iv) Protect fish habitat:

* recommend that changes be made to the Ontario Drainage Act in order to provide for the recognition and protection of fish habitat;

* use the federal Fisheries Act, the Public Lands Act (Ontario) and the Lakes and Rivers Improvement Act (Ontario) more frequently to protect fish habitat;

* utilize a Wetlands Policy for Ontario once it is approved;

* educate all users about the requirements and intent of existing and new legislation;

* provide input to municipal, industrial and private plans and proposals.

(v) Rehabilitate degraded habitat:

* identify inoperative dykes along the Great Lakes shoreline and investigate the potential to have them removed or breached;

* evaluate the effectiveness of artificial reefs;

* support habitat enhancement projects initiated by interest groups by providing expertise and funding under the MNR's community fisheries involvement program (CFIP).

(vi) Improve water quality and reduce the incidence of fish kills:

* co-operate with MAF and MOE to develop soil conservation programs across complete watersheds;

* encourage forest management programs on watersheds with high erosion impacts;

* assist other environmental agencies and industry to identify and eliminate chemical spills, leaks and general contaminant sources;

* educate the agricultural community about the effects that certain farm management practices can have on downstream fisheries, and promote more fisheries-beneficial practices through a co-operative effort with MOE, MAF and the conservation authorities.

(vii) Increase knowledge of the resident fish populations and their use:

* maintain current creel census programs on the western basin of Lake Erie, Lake St. Clair, lower Detroit River and Rondeau Bay;

* expand creel census programs to include other major sport fisheries on the St. Clair River and lower Lake Huron;

* develop estimates of allowable fish yield from the Detroit River, St. Clair River and the inland waters in the district;

* collect biological information on exploited but lower profile fisheries, such as muskellunge;

* conduct a comparative diet study of white perch and potentially affected fish species in Lake St. Clair and Lake Erie;

* establish baseline information on the frequency of internal and external lesions and diseases in conjunction with other intensive biological sampling programs (e.g., fecundity studies) on Lake St. Clair;

* expand representative index fishing for the fish communities in Lake St. Clair, Lake Erie, Lake Huron and Rondeau Bay;

* encourage native people to provide information on the amount by species of fish taken.

(viii) Continue contaminant monitoring and information programs:

* co-operate with MOE by collecting fish samples for contaminant analysis and by assisting in the publication and distribution of the "Annual Guide to Eating Ontario Sport Fish";

* co-operate with MOE to advise the public about selective fish cleaning techniques and the reasons for differences between species regarding relative contaminant levels;

* continue to collect fish samples for the International Joint Commission (IJC) programs.

(ix) Communicate management needs and develop new or improve existing management techniques:

* provide increased annual field input to work plans for MNR research and assessment units to ensure that district fisheries management needs are represented;

* solicit input from MNR research and assessment units when making plan review decisions which may affect Great Lakes fish communities;

* ensure that adequate monitoring programs are in place to assess responses to management activities;

* encourage technology transfer.

(x) Maximize the number of viable access points to shorelines, water courses and offshore sport fisheries:

* encourage angler use of shoreline facilities;

* develop programs to improve angler/landowner relations;

* encourage the development of additional boat launching facilities on the Thames River and the Sydenham River;

* support recreational marina development in non-sensitive habitat areas;

* encourge the Ontario Ministry of Tourism and Recreation (MTR)

to promote the charter boat fishery;

* encourage the maintenance of existing docks, piers and launching ramps and the construction of new ones.

(xi) Create inshore fisheries on Lake Erie and Lake Huron:

* investigate the use of artificial reefs in accessible inshore areas to provide a fishery for structure-attracted species and install if feasible.

(xii) Increase sport fishing for under-utilized species:

* promote appropriate changes in the species preferences of anglers;

* promote optimal preparation techniques to increase palatability for under-utilized species;

* encourage derbies for under-utilized species where a community imbalance occurs, such as for white perch on Lake St. Clair;

* promote taking of coarse fish species by means other than angling.

(xiii) Develop a comprehensive enforcement program:

* follow the Chatham District enforcement plan and amend it as the fishery changes, especially for offences impacting on fish habitat;

* evaluate the effectiveness of the Report-A-Poacher program as an enforcement tool;

* increase the utilization of deputy conservation officers in enforcement activities;

* increase enforcement efforts for sport fish activities.

(xiv) Increase the profile of fisheries in the eyes of the public:

* accelerate information transfer to the public on the value of fisheries and the importance of fish habitats;

* improve the effectiveness of communications with all user groups;

* develop a spirit of custodial management of the fisheries resource among user groups;

* advise the public on the capability of fish populations to withstand stress factors;

* publicize fisheries convictions;

* conduct a sport fishing symposium with walleye as the theme.

(xv) Reduce perceived and real conflicts with commercial fishermen and other user groups:

* encourage joint ventures (for example, through CFIP) to improve the resource base;

* assist in convening information exchange meetings between the representatives of different user groups;

* emphasize the benefits of sport fishing to all user groups;

* designate sport and commercial fishing areas and seasons for high intensity fisheries that are in conflict;

* maintain the present case by case review of development proposals, such as marinas, dredging, gas and aggregate extraction,

etc., in consideration of areas of significant fish habitat.

(xvi) Increase efforts to involve the public in fisheries management:

* make greater use of advisory councils or committees;

* encourage the public to initiate CFIP projects that are compatible with the objectives of the Chatham District Fisheries Management Plan.

(xvii) Continue to co-operate with Ohio and Michigan and adjacent Ontario MNR districts in managing fish populations of common concern:

* continue to support and contribute to Great Lake Committees of the Great Lakes Fishery Commission;

* maintain and increase information exchange with biologists and enforcement officers across the Ontario-Michigan and Ontario-Ohio borders;

* identify those populations of common concern;

* carry out studies to determine population dynamics and dispersal patterns of important populations of common concern;

* develop management strategies for these populations by drawing upon information provided by each agency under the guidance of the Great Lakes Fishery Commission.

(xviii) Increase fishing opportunities from inland areas of the district:

* encourage the private sector to provide fishing opportunities in stocked ponds or gravel pits;

* promote fishing for coarse fish species.

3.2.1.2 Coldwater Fisheries

(i) Manage for coldwater fishing opportunities:

* establish reliable chinook salmon egg collection sites within the lower Lake Huron watershed for the hatchery program of the Bluewater Anglers of Sarnia;

* continue to approve and provide technical guidance to the rearing and stocking of chinook salmon and rainbow trout into Lake Huron from the Bluewater Anglers' Hatchery at Sarnia to provide an artificial "put-grow-and-take" fishery;

* establish an upper limit for the production of chinook salmon from the Bluewater Anglers' Hatchery so that the stability of the forage base is not threatened;

* investigate the possibility of rearing and stocking hatchery-modified fish such as the triploid "super" salmon or skamania rainbow trout;

* continue to approve the stocking of catchable-sized rainbow trout at Erieau on Lake Erie to provide an artificial "put-and-take" fishery;

* encourage the private sector to provide artificial fisheries in spring-fed gravel pits or where habitat conditions allow;

* change Rondeau Bay from Division 3 to Division 2 in the Ontario Fisheries Regulations to provide a winter open season for rainbow trout.

(ii) Enhance existing fish populations:

* assist the Department of Fisheries and Oceans in sea lamprey assessment and control on Lake Huron by providing information on stream habitats and wounding rates;

* prevent the introduction or spread of disease by ensuring that only a disease-free stock of fish is planted, endemic diseases excepted.

(iii) Manage populations at levels within the resource capability:

* recommend that lake management committees of the Great Lakes Fishery Commission set limits on salmonid stocking levels consistent with the food supply;

* continue to communicate with American resource managers on the impact of stocking programs through the appropriate lake committee;

* evaluate the cost/benefit relationship of an artificial spawning and rearing channel for salmonids in the lower Lake Huron-St. Clair River area;

* conduct a diet study of salmon in Lake Huron and intensify the existing study on Lake Erie.

(iv) Promote access to inshore and offshore sport fisheries:

* support recreational marina development in non-sensitive habitat areas;

* encourge MTR to promote the charter boat fishery;

* encourage angling use of shoreline facilities.

(v) Evaluate the effectiveness of salmonid stocking programs:

* develop an active angler diary program for Lake Huron and the St. Clair River and increase the participation in the present program on Lake Erie;

* develop an access point/shoreline creel census to monitor the salmonid angler harvest;

* co-operate with local sportsmen's clubs by providing fish tags for marking stocked fish and receiving and analyzing tag return information.

(vi) Reduce contaminant levels in the aquatic environment:

* provide assistance to MOE and other agencies in detecting and controlling contaminant sources;

* utilize the federal Fisheries Act to reduce contaminant sources.

(vii) Continue existing contaminant monitoring and information programs:

* co-operate with MOE by collecting fish samples for contaminant analysis and by assisting in the publication and distribution of the "Annual Guide to Eating Ontario Sport Fish";

* continue to collect fish samples for use in IJC programs.

3.2.2 Commercial Fisheries

Objective

To allocate to the commercial fishing industry on Lake Erie and Lake Huron the optimum allowable harvest commensurate with resource maintenance and sport fishing requirements.

Target

Within the above objective, the target is to sustain an average annual harvest of 8,461,000 kilograms of fish from the Chatham District waters of Lake Erie and Lake Huron to the year 2000.

Detailed information on commercial targets for Lake Erie, Lake St. Clair and Lake Huron for each fish community type are listed in Table 3.2.2. This target does not include coarse fish for which a market does not currently exist.

Fish yields are bound to change with time. Eventual rehabilitation of the Lake Huron fishery as well as the development of new markets for coarse fish species in Lake Erie necessitates that commercial fish targets be reviewed on a five-year basis.

Discussion

In 1985 the ministry decided not to allocate walleye to the commercial fishery on Lake St. Clair. Nine of the ten licencees have signed an agreement with the ministry. This agreement provided these nine fishermen with financial compensation for the lack of a walleye allocation and seven of these fishermen accepted the financial incentive to completely withdraw from the fishery. As a result there are presently three active licences; however, it is anticipated that there will be no active licences by the year 2000.

While recognizing that long-term targets based on sustainable yields are integral to this fisheries management plan, the success or failure of the plan and the management programs emanating from it cannot be measured solely on the basis of whether or not specific targets are met in any given year. Rather, success will be determined by the extent to which fisheries managers are able to apply the harvest control system to manage fish populations at sustainable levels and be responsive to short-term fluctuations in fish populations. The commercial fish targets presented in this document provide a focus for planning. However, it is unlikely, nor is it intended, that these targets will exactly equal actual harvest levels in any one particular year.

During 1986, the 162 commercial licences in Chatham district had a combined allocation of 11,539,974 kilograms. Commercial harvests at this level cannot be sustained over the long-term. Commercial yields on Lake Erie are usually dominated by yellow perch, smelt, walleye and white bass, whereas the Lake Huron commercial fishery is primarily based on lake whitefish, walleye and yellow perch.

While the harvest control system is designed to stabilize fish populations and maintain viable fisheries, other issues must also be addressed.

The existence of a high intensity commercial fishery on Lake Erie and Lake Huron in conjunction with active angling fisheries necessitates that each user group must work towards mutual co-existence and must not adopt positions which are in direct opposition to one another. Given the immense fish productivity of the Great Lakes waters in Chatham District, it is the responsibilty of resource managers to allocate the fisheries resource on the basis of past use, overall economic benefits and projected demand to ensure equitable use.

Since approximately 85 per cent of the actual fish harvest by weight

Table 3.2.2 Annual Commercial Fish Harvest Targets[1] to the Year 2000 by Community Type From Chatham District Waters

	FISH COMMUNITY			
	COLDWATER	WARMWATER[3]	COARSE[2]	TOTAL
Lake Erie	-	6,472.9	1,594.5	8,067.4
Lake St. Clair	0	0	0	0
Lake Huron	204.6	153.8	35.2	393.6
Total	204.6	6,626.7	1,629.7	8,461.0

Legend

1 In thousands of kilograms.

2 Includes an allowance for unrecorded catch.

3 Smelt is included.

in the district is taken by the commercial fishery, sound management of this fishery is critical to the future status of the fish communities. While there may have been problems with uncontrolled harvests in the past, increasing compliance by the industry with the harvest control system in concert with the industry's "self-policing" initiatives indicate that a more responsible role is being taken by this user group. This augurs well for the future of the fishery.

Joint involvement by the angler and the commercial fisherman will help to resolve conflicts and enhance both recreational and economic benefits.

Strategies

The commercial fishery targets will be achieved utilizing the following management strategies and tactics:

(i) Maintain viable commercial fisheries at annual allowable yield levels:

* negotiate with the industry to set quotas at levels which will ensure maximized long-term availability of high valued species;

* continue thorough harvest monitoring and assessment programs to define biologically allowable yields on Lake Erie and Lake Huron;

* encourage co-operative assessment programs with the industry;

* investigate the appropriateness of allowing the commercial netting of fish on their spawning grounds on a lake-by-species basis;

* update regulations for harvest control on Lake Huron;

* encourage the development of a self-policing program of the commercial fishery on Lake Huron.

(ii) Encourage diversification in the industry and reduce wastage:

* adjust commercial licence conditions and/or quotas so that harvests reflect community structure;

* develop a mechanism for marketing incidental commercially caught fish without providing an incentive to exceed the quotas on species that have quotas;

* develop an improved mechanism for utilization of incidentally caught sport fish species;

* encourage the voluntary avoidance of commercial fishing from areas of high densities of young-of-the-year yellow perch when trawling for smelt in Lake Erie;

* support and encourage industry efforts to develop new and expanded domestic and foreign markets for under-utilized species;

* encourage the development of new technologies for expanded utilization of under-utilized species;

* re-name under-utilized fish species to increase their marketability.

(iii) Manage for balanced and healthy fish communities:

* recommend that lake management committees of the Great Lakes Fishery Commission set limits on salmonid stocking levels consistent with the food supply;

* continue to communicate with American resource managers on the impact of stocking programs through the appropriate lake committee;

* promote fishing for under-utilized species;

* encourage researchers to monitor the effects of contaminants on the health of fish stocks;

* assist the federal Department of Fisheries and Oceans in sea lamprey assessment by monitoring wounding and scarring rates in conjunction with other fisheries management programs.

(iv) Identify, protect and rehabilitate fish habitat and improve water quality:

* map spawning and nursery habitat and determine its significance for each important commercial fish species from Lake Erie and Lake Huron;

* use the Fisheries Act, the Public Lands Act and the Lakes and Rivers Improvement Act more frequently to protect fish habitat;

* utilize a Wetlands Policy for Ontario once it is approved;

* educate all users about the requirements and intent of existing and new legislation;

* provide fisheries habitat input and review to municipal, industrial and private plans and proposals;

* solicit input from MNR research and assessment units when making plan review decisions which may affect Great Lakes fish communities;

* educate farmers on the impact of poor land-use and farming practices on downstream water quality;

* co-operate with MAF and MOE to develop soil conservation programs on watersheds with high erosion impacts;

* identify inoperative dykes along Great Lakes shorelines and investigate the potential to have them removed or breached;

* provide assistance to MOE and other agencies in detecting and controlling contaminant sources;

* utilize the Fisheries Act to reduce contaminant sources.

(v) Maintain and enhance fisheries assessment programs:

* improve Lake Huron commercial fish harvest reporting systems;

* collect more biological information to increase the precision of allowable yield estimates and to increase the confidence in MNR's ability to accurately set commercial fish quotas;

* expand representative index fishing for the fish communities in Lake St. Clair, Lake Erie and Lake Huron to improve assessment of population status of commercial species;

* conduct a comparative diet study of white perch and potentially affected fish species in Lake St. Clair and Lake Erie;

* ensure that there are adequate monitoring programs are in place to assess responses to management activities;

* ensure technology transfer;

* conduct a tagging study on Lake Huron lake whitefish to determine stock characteristics and movement patterns.

(vi) Reduce perceived and real conflicts with sport fishermen and other user groups:

* encourage joint ventures, such as CFIP to improve the resource base;

* assist in convening information exchange meetings between the representatives of different user groups;

* emphasize the benefits of commercial fishing to all user groups;

* encourage commercial fishermen to advise recreational boaters on locations of fixed fishing gear;

* restrict the commercial fishery in its use of surface nets in heavily used recreational boating areas during peak seasons;

* encourage the voluntary avoidance of commercial fishing activities adjacent to high density cottage areas to eliminate the necessity of regulated restrictions;

* designate sport and commercial fish areas and seasons for high intensity fisheries that are in conflict;

* assist the natural gas industry in its efforts to provide commercial fishermen with well-head locations and the installation of net deflectors to reduce conflicts;

* encourage industry to inititate CFIP projects such as habitat rehabilitation and fish culture;

* maintain the present case by case review of development proposals (for example, for marinas, dredging, gas and aggregate extraction) in consideration of areas of significant fish habitat.

(vii) Continue to co-operate with Ohio and Michigan and adjacent Ontario MNR districts in managing fish populations of common concern:

* continue to support and contribute to Great Lake Committees of the Great Lakes Fishery Commission;

* maintain and increase information exchange with biologists and enforcement officers across the Ontario-Michigan and Ontario-Ohio borders;

* identify those populations of common concern;

* carry out studies to determine population dynamics and dispersal patterns of important populations of common concern;

* develop management strategies for these populations by drawing upon information provided by each agency under the guidance of the Great Lakes Fishery Commission.

3.2.3 Bait-Fish

Objective

To manage the local bait-fish population on a sustained yield basis to ensure viable commercial use, giving priority to local needs over export demands.

Target

To provide for a harvest of 1,825,000 dozen bait-fish by the year 2000. This target is partitioned among the main water bodies as follows:

Lake Erie and Detroit River
1,388,000 dozen

Lake St. Clair and Thames River
40,000 dozen

Lake Huron and St. Clair River
351,000 dozen

Rondeau Bay (included with Lake Erie)

Inland Waters
46,000 dozen

These targets differ from those presented in the Chatham District Land Use Guidelines as they reflect anticipated harvest levels rather than the former projections which were based on allowable bait-fish yields.

These targets may undergo considerable refinement during the period of this fisheries management plan as yield predictions and inconsistencies in the reporting of actual harvests are eliminated.

Discussion

During the 1977 to 1985 period, an annual average of 139 licences were active in the bait-fish industry, resulting in an annual harvest of 1,593,000 dozen bait-fish valued at $255,000.

Inconsistent reporting of bait-fish harvests is, in some cases, a result of the actual failure to report as well as variable accounts of what constitutes a "dozen"[1] minnows.

Bait-fish (primarily emerald and spottail shiners) are known to concentrate in sheltered harbour areas or to travel up and down the St. Clair River or the Detroit River during the spring and fall. At these times they are vulnerable to bait-fishing techniques. However, the low catch rates during the summer months have been of concern to the bait-fish industry. Assessment programs have yet to be designed or carried out to determine bait-fish distribution or status during these months.

Knowledge of the bait-fish component and how it contributes to the total forage base is crucial to an understanding of predator-prey relationships and the impact that intensive management efforts of predatory fish species have on the whole fish community.

Strategies

The following strategies will be utilized to achieve the bait-fish management objective and target:

(i) Increase knowledge of the bait-fish resource and its use:

* develop reliable allowable bait-fish yield estimates from inland and Great Lakes waters by initiating index fishing surveys to assess population abundance;

* identify and map critical habitat for bait-fish production;

* improve the accuracy and completeness of district bait-fish harvest reporting systems.

(ii) Regulate access of bait fishermen to the resource:

* maintain a schedule for access to the Bluewater Bridge area on the St. Clair River;

* implement schedules for other bait fishing areas as required.

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[1]One dozen minnows may represent anywhere from 12 to 100 minnows.

(iii) Maintain existing bait-fish populations:

* maintain the present management system to ensure capability for restricting entry and harvest where necessary;

* control harvests to ensure that bait-fish populations are not over exploited;

* inform commercial bait-fish operators and dealers of all of their legislated requirements;

* encourage bait-fishermen to use techniques which minimize wastage.

(iv) Minimize conflicts with other users and programs:

* monitor the bait-fish dealers to ensure that rare species or game fish are not sold.

(v) Ensure that there is an adequate supply of bait-fish to meet provincial angling needs:

* restrict the issuance of export permits during bait-fish supply shortages;

* assist retailers in locating alternate supplies of bait-fish;

* support the development of new capture techniques to utilize offshore bait-fish populations during seasons of short supply;

* investigate the feasibility of culturing bait-fish species to offset seasonal shortages.

3.2.4 Provincially Rare and Endangered Fish Species

Objective

To prevent the extinction of any native fish species.

Target

To ensure that no native fish species becomes extinct.

Discussion

Eight species of fish which are found in Chatham District have been designated by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) as being rare in Canada. An additional 23 species are now under review or are of interest to COSEWIC (Duckworth, 1986b). The blue pickerel, once present in Lake Erie, has already become extinct.

Management efforts will be concentrated on confirming the status of these fish species and eliminating whatever stresses are impacting on them.

Strategies:

(i) Identify and monitor populations of rare and potentially rare species:

* prepare status reports for species that are under review or of interest to COSEWIC;

* update stream surveys to monitor abundance and distribution of rare species.

(ii) Protect rare species and their habitat:

* prepare a brochure to educate the public on the existence of rare species;

* enforce legislation and review municipal, industrial and private plans and proposals;

* review the provision of allowing a bait-fishery in rare species' habitats and exclude this activity where necessary;

* review the provision of allowing harvest of rare species by bait-fishermen.

(iii) Develop programs to make rare species more common:

* investigate options for habitat rehabilitation;

* enforce fish habitat legislation.

4.0 IMPLEMENTATION

4.1 General Background

Consistent with the planning period established for all strategic land-use planning exercises, this fisheries management plan provides the direction for fisheries management activities within the Chatham District to the year 2000.

Within that period all activities should be consistent with the strategies and tactics which have been selected to achieve the stated targets and objectives.

Fisheries management strategies, outlined in the Lake Erie and Lake Huron Strategic Fisheries Management Plans and pertaining to Chatham District waters or resource users, will be implemented through the tactics outlined in this document.

Generally, strategies identified in this fisheries management plan will be implemented through:

(i) the preparation of five-year implementation schedules;

(ii) programs and projects approved and funded under the Ministry of Natural Resources' work planning process;

(iii) input to or participation in other programs carried out by the Ministry of Natural

(iv) co-operative efforts with local sportsmen's organizations and private interest groups under the community fisheries involvement program, or the community fisheries enhancement program;

(v) review and approval of work plans and proposals from municipalities, private landowners and other government agencies.

This section of the fisheries management plan will establish the first five-year (1987-91) implementation schedule. The annual work plan will address both the cost and timing for the implementation of tactics.

While this schedule may be updated annually, the implementation schedule for subsequent five-year periods will be formally prepared in 1991 and 1996, respectively. These schedules will be subject to public notice and review and must be approved by the local MNR District Manager and Regional Director. Should any significant modifications or revisions to the implementation schedule or fisheries management plan be required, the same public review and approval process shall be followed.

Projects to be undertaken during the next five-year period have been identified according to those which can be completed under existing funding, those which would require additional funding and those which would require a co-operative effort with other groups or agencies. Many of these management activities initiated under current funding levels would be completed by permanent staff supplemented by seasonal employees and perhaps with the assistance of local sportsmen club members

and/or commercial fishermen's associations.

Routine planning and administrative functions have not been included. Similarly, enforcement activities are not detailed as they have been summarized in a separate enforcement plan for the Chatham District (MNR, 1986c). It should be realized, however, that many strategies and tactics, such as enforcing existing legislation or encouraging public participation, have been identified in this plan and are carried out on an ongoing basis.

A number of fisheries management projects, such as fish rearing and stocking, have been completed in recent years by local sportsmen's organizations under the community fisheries involvement program. Since it is difficult to predict similar projects which will be initiated in the future, they have not been included in this schedule. It should be realized, however, that the implementation schedule will provide direction for future CFIP projects and, as a result, facilitate the completion of projects outlined in the five-year implementation schedules.

4.2 Implementation Schedule, 1987-91

The first five-year (1987-91) fisheries management implementation schedule is detailed at the end of this section. It should be recognized that all fisheries projects are subject to the requirements of the Environmental Assessment Act. As a result of the need to comply with class assessment requirements, there may be a change to the specific tactics identified in this plan.

During the next five-year period the fisheries management program will concentrate on monitoring of harvest levels and assessment of fish stocks.

Monitoring of harvests will involve a number of operational programs including administration and auditing of the port observer "self-policing" system, commercial catch sampling, enforcement of the harvest control system, creel census and angler survey projects and bait-fishermen audits. These programs will be carried out by field staff located at a number of locations within the Chatham District. In addition, staff of MNR's Lake Huron Fisheries Assessment Unit will be monitoring harvests in the commercial fishery on Lake Huron.

On Lake Erie and the Detroit River, the bulk of these programs will be the responsibility of staff from the ministry's Lake Erie Fisheries Station. With the Lake St. Clair fishery, the Lake St. Clair Fisheries Assessment Unit will continue to carry out creel census, habitat surveys and commercial catch sampling. In addition, this unit will be carrying out creel census on the St. Clair River. Staff based out of MNR's Chatham District Office will carry out creel census programs on Rondeau Bay and Lake Huron as well as enforcement of the commercial fishery on Lake St. Clair and Lake Huron.

Population assessment will be conducted through index netting programs, creel census, and fish tagging and release programs. It is anticipated that assessment unit staff will be primarily responsible for these activities on Lake Erie and Lake St. Clair while district staff, pending additional funding, will become more involved with such activities on Lake Huron. District Office staff will be responsible for population assessment in the inland

waters such as the Sydenham River and the Thames River.

A number of habitat assessment programs are proposed but are for the most part contingent upon new funding. Key areas include the Thames River, the eastern shore area of Lake St. Clair, the reefs and islands in the western basin of Lake Erie, the northern shoreline of the central and western basins of Lake Erie, the Lake Huron shoreline, the Detroit River and the St. Clair River and Rondeau Bay.

Within the next five years, fish stocking will be conducted primarily to create artificial fisheries.

Habitat rehabilitation projects will be conducted only after habitat assessment surveys have been completed. For the near future, these will be limited to Rondeau Bay and to other inland waterways where problems are not intractable and where impacts on downstream water quality and fish habitat are considered a problem.

In summary, management efforts will be aligned to complete the modernization of the commercial fishery program and to monitor the angling fishery. Increased attention will be given to curbing habitat loss and to working with other agencies to improve water quality and to reduce contaminant loads. These concerns are critical to maintaining viable fisheries with wholesome products.

There will be projects that fulfill some specific tactics that may not be identified in the first (1987-1991) implementation schedule but may be identified in subsequent implementation schedules. The implementation schedule for the 1987-1991 period follows:

FISHERIES MANAGEMENT IMPLEMENTATION SCHEDULE, 1987 - 1991, CHATHAM DISTRICT

SPORT FISH PROGRAM

WARMWATER FISHERIES

STRATEGY	TACTICS	LOCATION PRIORITIES	ISSUES/PROBLEMS ADDRESSED	CAN BE DONE WITH PRESENT FUNDING	REQUIRES ADDITIONAL FUNDING
- Stabilize the Lake Erie smelt population	* investigate the possibility of controlling the harvest by sport fishermen	1) Lake Erie	demand exceeds supply		yes
	* conduct a creel census type survey of the Lake Erie smelt sport fishery once every five years	1) Lake Erie	"		yes
	* reduce predatory stress on smelt by negotiating for lower salmon stocking rates within United States' jurisdictions	1) Lake Erie	"	yes	
- Increase production from existing fisheries	* enhance fish habitat by supporting MOE and MAF efforts to reduce soil erosion across watersheds	1) Rondeau Bay 2) Sydenham River	habitat loss and degradation		yes
	* evaluate artificial reefs and extend practice where it is of value for fish production	1) Rondeau Bay	"		yes
- Identify and evaluate fish habitat	* survey and map spawning and nursery habitat and determine its significance for each important sport species	1) Lake St. Clair 2) Thames River 3) Lake Erie 4) Lake Huron 5) Rondeau Bay 6) Detroit River 7) St. Clair River	"		yes

WARMWATER FISHERIES CONTINUED

STRATEGY	TACTICS	LOCATION PRIORITIES	ISSUES/PROBLEMS ADDRESSED	CAN BE DONE WITH PRESENT FUNDING	REQUIRES ADDITIONAL FUNDING
- Protect fish habitat	* recommend changes to the Ontario Drainage Act to provide for the recognition and protection of fish habitat	1) provincial	habitat loss and degradation		yes
	* use the Fisheries Act (Canada), the Public Lands Act and the Lakes and Rivers Improvement Act more frequently to protect fish habitat	1) all waters	*		yes
	* utilize a Wetlands Policy for Ontario when approved	1) all waters	*	yes	
	* educate all users about the requirements and intent of existing and new legislation	1) throughout district	*		yes
	* provide fisheries habitat input and review to municipal, industrial, and private plans and proposals	1) all waters	*		yes
- Rehabilitate degraded habitat	* identify inoperative dykes along Great Lakes shoreline and investigate the potential to have them removed or breached.	1) Lake St. Clair 2) Lake Erie 3) Detroit River	*		yes
	* evaluate effectiveness of artificial reefs	1) Rondeau Bay	*		yes
	* support habitat enhancement projects initiated by interest groups by providing expertise and funding under CFIP	1) throughout district	*	yes	

WARMWATER FISHERIES CONTINUED

STRATEGY	TACTICS	LOCATION PRIORITIES	ISSUES/PROBLEMS ADDRESSED	CAN BE DONE WITH PRESENT FUNDING	REQUIRES ADDITIONAL FUNDING
- Improve water quality and reduce the incidence of fish kills	* co-operate with MAF and MOE to develop soil conservation programs across complete watersheds	1) Rondeau Bay 2) Sydenham River	habitat loss and degradation		yes
	* encourage forest management programs on the Rondeau Bay watershed	1) Rondeau Bay	"	yes	
	* assist other environmental agencies and industry to identify and eliminate chemical spills, leaks and general contaminant sources	1) St. Clair River 2) Detroit River	"	yes	
	* educate the agricultural community about the benefits of wise farm management practices to downstream fisheries through a co-operative effort with the MOE, MAF and the conservation authorities	1) inland waters	"		yes
- Increase knowledge of the resident fish populations and their use	* maintain current creel census programs	1) Lake St. Clair 2) western basin of Lake Erie 3) lower Detroit River 4) Rondeau Bay	incomplete scientific knowledge	yes	
	* expand creel census program to cover all major sport fisheries	1) St. Clair River 2) Lake Huron 3) Lake Erie 4) Lake St. Clair	"		yes

WARMWATER FISHERIES CONTINUED

STRATEGY	TACTICS	LOCATION PRIORITIES	ISSUES/PROBLEMS ADDRESSED	CAN BE DONE WITH PRESENT FUNDING	REQUIRES ADDITIONAL FUNDING
	* develop estimates of allowable fish yield for specific waters	1) Detroit River 2) St. Clair River 3) Inland Waters	incomplete scientific knowledge		yes
	* collect biological information on exploited but lower profile fisheries, e.g. muskellunge	1) Lake St. Clair	"		yes
	* conduct a comparative diet study of white perch and potentially affected fish species	1) Lake St. Clair 2) Lake Erie	"		yes
	* establish baseline information on the frequency of internal and external lesions and diseases	1) Lake St. Clair 2) Detroit River 3) St. Clair River	"		yes
	* expand representative index netting	1) Lake Huron 2) Lake Erie 3) Rondeau Bay 4) Lake St. Clair	"		yes
	* encourage native people to provide information on the amount and species of fish taken	1) Thames River 2) Lake Huron 3) Lake St. Clair	"	yes	
- Continue contaminant monitoring and information programs	* co-operate with MOE by collecting fish samples for contaminant analysis and by assisting in the publication and distribution of the "Annual Guide to Eating Ontario Sport Fish"	1) where necessary	wholesomeness of fish impaired by contaminants	yes	

WARMWATER FISHERIES CONTINUED

STRATEGY	TACTICS	LOCATION PRIORITIES	ISSUES/PROBLEMS ADDRESSED	CAN BE DONE WITH PRESENT FUNDING	REQUIRES ADDITIONAL FUNDING
	* co-operate with MOE to advise the public about selective fish cleaning techniques and the reasons for differences between species regarding relative contaminant levels	1) where necessary	wholesomeness of fish impaired by contaminants	yes	
	* maintain assessment unit participation in the IJC programs by collecting fish samples	1) Lake Erie 2) Lake Huron	"	yes	
- Communicate management needs and develop new or improved existing management techniques	* provide increased annual field input to work plans for research and assessment units	1) Lake Erie 2) Lake St. Clair 3) Lake Huron	incomplete scientific knowledge	yes	
	* solicit input from research/assessment units when making plan review decisions which may affect Great Lakes fish communities	1) Lake Erie 2) Lake St. Clair 3) Lake Huron	"	yes	
	* ensure that adequate monitoring programs are in place to assess responses to management activities	1) Lake Erie 2) Lake St. Clair 3) Lake Huron	"	yes	
	* encourage technology transfer	1) all MNR assessment units and Chatham District Office	"	yes	

WARMWATER FISHERIES CONTINUED

STRATEGY	TACTICS	LOCATION PRIORITIES	ISSUES/PROBLEMS ADDRESSED	CAN BE DONE WITH PRESENT FUNDING	REQUIRES ADDITIONAL FUNDING
- Maximize the number of available access points to shorelines, watercourses and offshore sport fisheries	* encourage angling use of shoreline facilities	1) Detroit River 2) St. Clair River 3) Lake Erie	limited access to the resource	yes	
	* develop programs to improve angler/landowner relations	1) Thames River	•		yes
	* encourage development of additional boat launches	1) Thames River 2) Sydenham River	•		yes
	* support recreational marina development in non-sensitive habitat areas	1) Lake Erie 2) Lake St. Clair 3) Lake Huron	•		yes
	* encourage MTR to promote the charter boat fishery	1) Lake Erie 2) Lake St. Clair 3) Lake Huron	•		yes
	* encourage maintenance of existing docks, piers and launching ramps and construction of new ones	1) Lake Erie 2) Lake St. Clair 3) Lake Huron	•		yes
- Create inshore fisheries	* investigate the use of artificial reefs in accessible inshore areas to provide a fishery for structure-dependent species and install if feasible.	1) Lake Erie 2) Lake Huron	•		yes

MARSHWATER FISHERIES CONTINUED

STRATEGY	TACTICS	LOCATION PRIORITIES	ISSUES/PROBLEMS ADDRESSED	CAN BE DONE WITH PRESENT FUNDING	REQUIRES ADDITIONAL FUNDING
- Develop a comprehensive enforcement program	* follow the district enforcement plan and amend it as the fishery changes, especially offences impacting on fish habitat	1) throughout district	illegal activity and harvest	yes	
	* evaluate the effectiveness of the Report-A-Poacher program as an enforcement tool	1) St. Clair River 2) Detroit River	"	yes	
	* increase utilization of deputy conservation officers in enforcement activities	1) throughout district	"	yes	
	* increase enforcement effort on sport fishing activities	1) St. Clair River 2) Detroit River	"		yes
- Increase the profile of fisheries in the eyes of the public	* accelerate information transfer to the public on the value of fisheries and the importance of fish habitats	1) throughout district	lack of public awareness		yes
	* improve the effectiveness of communications with all user groups	1) Lake Erie 2) Lake Huron 3) Lake St. Clair	"		yes
	* publicize fisheries convictions	1) Lake Erie 2) Lake Huron 3) Lake St. Clair	"	yes	
	* conduct a sport fishing symposium with walleye as the theme	1) Chatham	"		yes
- Reduce perceived and real conflicts with commercial fishermen and other user groups	* encourage joint ventures such as CFIP to improve the resource base	1) Lake Erie 2) Lake St. Clair 3) Lake Huron	resource user conflicts		yes

MARKWATER FISHERIES CONTINUED

STRATEGY	TACTICS	LOCATION PRIORITIES	ISSUES/PROBLEMS ADDRESSED	CAN BE DONE WITH PRESENT FUNDING	REQUIRES ADDITIONAL FUNDING
	* assist in convening information exchange meetings between the representatives of different user groups	1) Lake Huron 2) Lake Erie	resource user conflicts	yes	
	* designate exclusive sport or commercial fishing areas and seasons for high intensity fisheries that are in conflict	1) Lake St. Clair 2) Lake Erie 3) Lake Huron	•	yes	
	* maintain present case by case review of development proposals	1) as required	•	yes	
- Increase efforts to involve the public in fisheries management	* make greater use of advisory councils or committees	1) Lake Huron 2) Lake Erie 3) Lake St. Clair	•	yes	
	* encourage the public to initiate CFIP projects that are compatible with the district fisheries management plan	1) throughout district	•		yes
- Continue to co-operate with Ohio, Michigan and adjacent Ontario MNR districts in managing fish populations of common concern	* continue to support and contribute to Great Lake Committees of the Great Lakes Fisheries Commission	1) Lake Erie 2) Lake St. Clair 3) Lake Huron 4) Detroit River 5) St. Clair River	managing fish populations of common concern	yes	
	* maintain and increase information exchange with biologists and enforcement officers across the Ontario-Michigan and Ontario-Ohio borders	1) Lake Erie 2) Lake St. Clair 3) Lake Huron 4) Detroit River 5) St. Clair River	•		yes

MARINE WATER FISHERIES CONTINUED

STRATEGY	TACTICS	LOCATION PRIORITIES	ISSUES/PROBLEMS ADDRESSED	CAN BE DONE WITH PRESENT FUNDING	REQUIRES ADDITIONAL FUNDING
	* identify those populations of common concern	1) Lake Erie 2) Lake St. Clair 3) Lake Huron	managing fish populations of common concern		yes
	* carry out studies to determine population dynamics and dispersal patterns of important populations of common concern	1) Lake Erie 2) Lake St. Clair 3) Lake Huron	"		yes
	* develop management strategies for these populations by drawing upon information provided by each agency under the guidance of the Great Lakes Fisheries Commission	1) Lake Erie 2) Lake St. Clair 3) Lake Huron	"		yes
- Increase fishing opportunities from inland areas of the district	* encourage private sector to provide fishing opportunities in stocked ponds or gravel pits	1) inland waters	demand exceeds supply		yes
	* promote fishing for coarse fish species	1) inland waters	"		yes

FISHERIES MANAGEMENT IMPLEMENTATION SCHEDULE, 1987 - 1991, CHATHAM DISTRICT

SPORT FISH PROGRAM

COLDWATER FISHERIES

STRATEGY	TACTICS	LOCATION PRIORITIES	ISSUES/PROBLEMS ADDRESSED	CAN BE DONE WITH PRESENT FUNDING	REQUIRES ADDITIONAL FUNDING
- Manage for coldwater fishing opportunities	* continue to approve and provide technical guidance to the Bluewater Anglers' Hatchery for chinook salmon and rainbow trout stocking	1) St. Clair River and Lake Huron	demand exceeds supply		yes
	* establish reliable chinook salmon egg collection sites for the Bluewater Anglers	1) lower Lake Huron	•		yes
	* establish an upper limit for the production of chinook salmon from the Bluewater Anglers' Hatchery	1) Lake Huron	•		yes
	* investigate the possibility of rearing and stocking hatchery-modified fish such as the triploid "super" salmon or skamania rainbow trout	1) Lake Huron	•		yes
	* continue to approve the stocking of catchable-sized rainbow trout by the Pointe Aux-Pins Salmon and Trout Club	1) Erieau, central basin Lake Erie	•	yes	
	* encourage the private sector to develop pits or ponds for rainbow trout where habitat conditions are favourable	1) inland areas with underlying sand/gravel overburden	•		yes
	* change Rondeau Bay from Division 3 to Division 2 in Ontario Fisheries Regulations to provide a winter open season for rainbow trout	1) Rondeau Bay	•	yes	

COLDWATER FISHERIES CONTINUED

STRATEGY	TACTICS	LOCATION PRIORITIES	ISSUES/PROBLEMS ADDRESSED	CAN BE DONE WITH PRESENT FUNDING	REQUIRES ADDITIONAL FUNDING
- Enhance existing fish populations	* assist the Department of Fisheries and Oceans in sea lamprey assessment and control	1) Lake Huron	demand exceeds supply	yes	
	* ensure that only disease-free stocks of fish are planted, endemic diseases excepted	1) Lake Huron 2) Lake Erie	"		yes
- Manage populations at levels within the resource capability	* recommend that the lake management committees (GLFC) set limits on salmonid stocking levels consistent with the food supply	1) Lake Huron 2) Lake Erie	"	yes	
	* communicate the impact of stocking programs to American resource managers	1) Lake Huron 2) Lake Erie	"		yes
	* evaluate the cost/benefit relationship of an artificial spawning and rearing channel for salmonids	1) Lake Huron-St. Clair River	"		yes
	* conduct a salmon diet study on Lake Huron and intensify existing study on Lake Erie	1) Lake Huron 2) Lake Erie	"		yes
- Promote access to inshore and offshore sport fisheries	* support recreational marina development in non-sensitive habitat areas	1) Lake Erie 2) Lake St. Clair 3) Lake Huron	limited access to the resource	yes	
	* encourage MTR to promote charter boat fishery	1) Lake Erie 2) Lake St. Clair 3) Lake Huron	"		yes
	* encourage angling use of shoreline facilities	1) Lake Erie 2) Lake St. Clair 3) Lake Huron	"	yes	

COLDWATER FISHERIES CONTINUED

STRATEGY	TACTICS	LOCATION PRIORITIES	ISSUES/PROBLEMS ADDRESSED	CAN BE DONE WITH PRESENT FUNDING	REQUIRES ADDITIONAL FUNDING
- Evaluate the effectiveness of salmonid stocking programs	* develop an active angler diary program and increase participation in the program conducted by MNR's Lake Erie Fisheries Assessment Unit	1) Lake Huron-St. Clair River 2) Lake Erie	demand exceeds supply		yes
	* provide fish tags to local sportsmen's clubs for marking stocked fish and receive and analyze tag return information	1) Lake Huron 2) Lake Erie	"		yes
	* develop an access point/shoreline creel census to monitor the salmonid angler harvest	1) Lake Huron and St. Clair River	"		yes
- Reduce contaminant levels in aquatic environment	* provide assistance to MOE and other agencies in detecting and controlling contaminant sources	1) all waters	wholesomness of fish impaired by contaminants	yes	
	* utilize the Fisheries Act to reduce contaminant sources	1) all waters	"		yes
- Continue contaminant monitoring and information programs	* collect fish samples for contaminant analysis and assist in distribution of the "Annual Guide to Eating Ontario Sport Fish."	1) from waters as recommended by MOE	"	yes	
	* assessment units to continue to participate in the IJC programs by collecting fish samples	1) Lake Erie 2) Lake Huron	"	yes	

FISHERIES MANAGEMENT IMPLEMENTATION SCHEDULE, 1987 - 1991, CHATHAM DISTRICT

COMMERCIAL FISH PROGRAM

STRATEGY	TACTICS	LOCATION PRIORITIES	ISSUES/PROBLEMS ADDRESSED	CAN BE DONE WITH PRESENT FUNDING	REQUIRES ADDITIONAL FUNDING
- Maintain viable commercial fisheries at annual allowable yield levels	* negotiate with the industry to set quotas at levels to ensure maximized long-term availability of high valued species	1) Lake Erie 2) Lake Huron	demand exceeds supply	yes	
	* continue thorough harvest monitoring and assessment programs to define biologically allowable yields	1) Lake Erie 2) Lake Huron	"		yes
	* update regulations and enhance enforcement of harvest control	1) Lake Huron	"		yes
	* initiate self-policing	1) Lake Huron	"		yes
	* encourage co-operative assessment programs with the industry	1) Lake Erie 2) Lake Huron	"	yes	
	* investigate the appropriateness of allowing the commercial netting of fish on their spawning grounds on a lake by species basis	1) Lake Huron 2) Lake Erie	"		yes
- Encourage the industry to diversify and reduce wastage	* support and encourage industry efforts to develop new and expanded domestic and foreign markets for under-utilized species	1) Lake Erie 2) Lake Huron 3) Lake St. Clair	under-utilized fish species		yes
	* adjust commercial licence conditions and/or quotas so that harvests reflect community structure	1) Lake Erie 2) Lake Huron 3) Lake St. Clair	"	yes	

COMMERCIAL FISH PROGRAM CONTINUED

STRATEGY	TACTICS	LOCATION PRIORITIES	ISSUES/PROBLEMS ADDRESSED	CAN BE DONE WITH PRESENT FUNDING	REQUIRES ADDITIONAL FUNDING
	* encourage development of new technologies for expanded utilization of under-utilized species	1) Lake Erie 2) Lake Huron 3) Lake St. Clair	under-utilized fish species		yes
	* rename under-utilized fish species to increase marketability	1) where applicable	*	yes	
	* develop a mechanism for marketing incidental commercially caught fish without providing an incentive to exceed the quotas on species that have quotas	1) Lake Erie 2) Lake Huron	demand exceeds supply	yes	
	* develop an improved mechanism for utilization of incidentally caught sport fish species	1) Lake Erie 2) Lake Huron	*	yes	
	* encourage the voluntary avoidance of commercial fishing from areas of high densities of young-of-the-year yellow perch when trawling for smelt	1) Lake Erie	*	yes	
- Manage for balanced healthy, fish communities	* recommend that lake management committees (GLFC) set limits on salmonid stocking levels consistent with the food supply	1) Lake Huron 2) Lake Erie	managing fish species of common concern	yes	
	* continue to communicate with American resource managers on the impact of stocking programs through the appropriate lake committee	1) Lake Huron 2) Lake Erie	*	yes	
	* encourage researchers to monitor the effects of contaminants on the health of fish stocks	1) Lake St. Clair 2) Lake Erie	demand exceeds supply		yes

COMMERCIAL FISH PROGRAM CONTINUED

STRATEGY	TACTICS	LOCATION PRIORITIES	ISSUES/PROBLEMS ADDRESSED	CAN BE DONE WITH PRESENT FUNDING	REQUIRES ADDITIONAL FUNDING
	* assist the Department of Fisheries and Oceans in sea lamprey assessment by monitoring wounding and scarring rates in conjunction with other fisheries management programs	1) Lake Huron 2) Lake Erie	demand exceeds supply	yes	
- Identify, protect and rehabilitate fish habitat and improve water quality	* map spawning and nursery habitat and determine its significance for each important fish species	1) Lake Erie 2) Lake St. Clair 3) Lake Huron	habitat loss and degradation		yes
	* use the Federal Fisheries Act, the Public Lands Act and the Lakes and Rivers Improvement Act more frequently to protect fish habitat	1) Lake Erie 2) Lake St. Clair 3) Lake Huron	*	yes	
	* utilize a Wetlands Policy for Ontario when approved	1) Lake Erie 2) Lake St. Clair 3) Lake Huron	*	yes	
	* educate all users about the requirements and intent of existing and new legislation	1) Lake Erie 2) Lake St. Clair 3) Lake Huron	*		yes
	* provide fisheries habitat input and review to municipal, industrial, and private plans and proposals	1) Lake Erie 2) Lake St. Clair 3) Lake Huron	*	yes	
	* solicit input from MNR research/assessment units when making plan review decisions which may affect Great Lakes fish communities	1) Lake Erie 2) Lake St. Clair 3) Lake Huron	*	yes	

COMMERCIAL FISH PROGRAM CONTINUED

STRATEGY	TACTICS	LOCATION PRIORITIES	ISSUES/PROBLEMS ADDRESSED	CAN BE DONE WITH PRESENT FUNDING	REQUIRES ADDITIONAL FUNDING
	* educate farmers on the impact of poor land use and farming practices on downstream water quality	1) Rondeau Bay 2) Sydenham River	habitat loss and degradation		yes
	* co-operate with MAF and MOE to develop soil conservation programs across complete watersheds	1) Rondeau Bay 2) Sydenham River	"		yes
	* identify inoperative dykes along Great Lakes shoreline and investigate the potential to have them removed or breached	1) Lake St. Clair 2) Detroit River	"		yes
	* provide assistance to MOE and other agencies in detecting and controlling contaminant sources	1) St. Clair River 2) Detroit River	"	yes	
	* utilize the Fisheries Act to reduce contaminant sources	1) St. Clair River 2) Detroit River	"		yes
- Maintain and enhance fisheries assessment programs	* develop a daily commercial fish harvest reporting system	1) Lake Huron	incomplete scientific knowledge		yes
	* collect more biological information to increase precision of allowable yield estimates and increase confidence in ability to accurately set commercial fish quotas	1) Lake Erie 2) Lake Huron	"		yes
	* expand representative index fishing to improve assessment of population status of commercial species	1) Lake Erie 2) Lake St. Clair 3) Lake Huron	"		yes

COMMERCIAL FISH PROGRAM CONTINUED

STRATEGY	TACTICS	LOCATION PRIORITIES	ISSUES/PROBLEMS ADDRESSED	CAN BE DONE WITH PRESENT FUNDING	REQUIRES ADDITIONAL FUNDING
	* conduct a comparative diet study of white perch and potentially affected fish species	1) Lake St. Clair 2) Lake Erie	incomplete scientific knowledge		yes
	* ensure that adequate monitoring programs are in place to assess responses to management activities	1) Lake Erie 2) Lake Huron 3) Lake St. Clair	•		yes
- Maintain and enhance fisheries assessment programs	* encourage technology transfer	1) all MNR assessment units and district office	•		yes
	* conduct a tagging study of lake whitefish to determine stock characteristics and movement patterns	1) Lake Huron	•		yes
- Reduce perceived and real conflicts with sport fishermen and other user groups	* encourage joint ventures, e.g. CFIP, to improve the resource base	1) Lake Erie 2) Lake Huron 3) Lake St. Clair	resource user conflicts	yes	
	* assist in convening information exchange meetings between the representatives of different user groups	1) Lake Erie 2) Lake Huron 3) Lake St. Clair	•	yes	
	* emphasize the benefits of commercial fishing to all user groups	1) Lake Erie 2) Lake Huron 3) Lake St. Clair	•		yes
	* encourage commercial fishermen to advise recreational boaters on locations of fixed fishing gear	1) Lake Erie 2) Lake Huron	•	yes	

COMMERCIAL FISH PROGRAM CONTINUED

STRATEGY	TACTICS	LOCATION PRIORITIES	ISSUES/PROBLEMS ADDRESSED	CAN BE DONE WITH PRESENT FUNDING	REQUIRES ADDITIONAL FUNDING
	* restrict commercial fishery from using surface nets in heavily used recreational boating areas and during peak seasons	1) Lake Erie 2) Lake Huron	resource user conflicts	yes	
	* encourage voluntary avoidance of commercial fishing activities adjacent to high density cottage areas to eliminate the necessity of regulated restrictions	1) Lake Erie 2) Lake Huron	•	yes	
	* designate sport and commercial fish areas and seasons for high intensity fisheries that are in conflict	1) Lake Erie 2) Lake Huron	•	yes	
	* maintain the present case by case review of development proposals (e.g. marinas, dredging, gas and aggregate extraction) in consideration of areas of significant fish habitat	1) Lake St. Clair 2) Lake Erie 3) Lake Huron	•	yes	
	* encourage industry to initiate CFIP projects such as habitat rehabilitation and fish culture	1) Lake Huron	•	yes	
	* assist the natural gas industry in its efforts to provide commercial fishermen with well-head locations and the installation of net deflectors to reduce conflicts	1) Lake Erie	•	yes	

COMMERCIAL FISH PROGRAM CONTINUED

STRATEGY	TACTICS	LOCATION PRIORITIES	ISSUES/PROBLEMS ADDRESSED	CAN BE DONE WITH PRESENT FUNDING	REQUIRES ADDITIONAL FUNDING
- Continue to co-operate with Ohio, Michigan and adjacent Ontario MNR districts in managing fish populations of common concern	* continue to support and contribute to Great Lake Committees of GLFC	1) all Great Lakes	resource user conflicts	yes	
	* maintain and increase information exchange with biologists and enforcement officers across the Ontario-Michigan and Ontario-Ohio borders	1) all Great Lakes	•		yes
	* identify those populations of common concern	1) all Great Lakes	•		yes
	* develop management strategies for these populations by drawing upon information provided by each agency under the guidance of GLFC	1) all Great Lakes	•		yes
	* carry out studies to determine population dynamics and dispersal patterns of important populations of common concern	1) all Great Lakes	•		yes

FISHERIES MANAGEMENT IMPLEMENTATION SCHEDULE, 1987 - 1991, CHATHAM DISTRICT

BAIT-FISH

STRATEGY	TACTICS	LOCATION PRIORITIES	ISSUES/PROBLEMS ADDRESSED	CAN BE DONE WITH PRESENT FUNDING	REQUIRES ADDITIONAL FUNDING
- Increase knowledge of the bait-fish resource and its use	* improve the accuracy and completeness of district bait-fish harvest reporting systems	1) throughout district	incomplete scientific knowledge	yes	
- Regulate access of bait fishermen to the resource	* maintain schedule for access to Bluewater Bridge area on the St. Clair River	1) St. Clair River	limited access to the resource	yes	
	* implement schedules for other bait-fishing areas as required	1) all waters	"	yes	
- Maintain existing bait-fish populations	* maintain present management system to ensure capability to restrict entry and harvest where necessary	1) throughout district	demand exceeds supply	yes	
	* control harvests to ensure bait-fish populations are not over exploited	1) throughout district	demand exceeds supply	yes	
	* inform commercial bait-fish operators and dealers of all their legislated requirements	1) throughout district	illegal activity	yes	
	* encourage bait-fishermen to use techniques which minimize wastage	1) throughout district	demand exceeds supply		yes
- Minimize conflicts with other users and programs	* monitor bait-fish dealers to ensure that rare species or game fish are not sold	1) throughout district	resource user conflicts		yes

BAIT-FISH CONTINUED

STRATEGY	TACTICS	LOCATION PRIORITIES	ISSUES/PROBLEMS ADDRESSED	CAN BE DONE WITH PRESENT FUNDING	REQUIRES ADDITIONAL FUNDING
- Ensure that there is an adequate supply of bait-fish to meet provincial angling needs	* restrict the issuance of export permits during bait-fish supply shortages	1) throughout district	demand exceeds supply	yes	
	* assist retailers in locating alternate supplies of bait-fish	1) throughout district	"	yes	
	* support the development of new capture techniques to utilize offshore bait-fish populations during seasons of short supply	1) throughout district	"		yes
	* investigate the feasibility of culturing bait-fish species to offset seasonal shortages	1) throughout district	"		yes

FISHERIES MANAGEMENT IMPLEMENTATION SCHEDULE, 1987 - 1991, CHATHAM DISTRICT

RARE AND ENDANGERED FISH SPECIES

STRATEGY	TACTICS	LOCATION PRIORITIES	ISSUES/PROBLEMS ADDRESSED	CAN BE DONE WITH PRESENT FUNDING	REQUIRES ADDITIONAL FUNDING
- Identify and monitor populations of rare and potentially rare species	* prepare status reports for species under review and of interest to the "Committee on the Status of Endangered Wildlife in Canada" (COSEWIC)	1) throughout district	rare species		yes
	* update stream surveys to monitor abundance and distribution of rare species	1) Sydenham River watershed	*		yes
- Protect rare species and their habitat	* prepare a brochure to educate the public on the existence of rare species	1) throughout district	*		yes
	* enforce legislation and use plan review	1) throughout district	*	yes	
	* review provision of allowing bait-fishery in rare species habitats and exclude where necessary	1) throughout district	*	yes	
	* review provision of allowing harvest of rare species by bait-fishermen	1) throughout district	*	yes	
- Develop programs to make rare species more common	* investigate options for habitat rehabilitation	1) throughout district	*		yes
	* enforce fish habitat legislation	1) throughout district	*		yes

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GLOSSARY

ALLOWABLE YIELD

* The yield by species as a result of partitioning the potential yield. The sum of allowable yields by species will not necessarily add up to the potential yield.

ANGLER DAY

* A single fishing trip equated to four man-hours of fishing effort.

ANGLING OPPORTUNITY

* A measure of supply to indicate the amount of use which a resource can sustain. An angling opportunity may be defined as one fishing trip not exceeding one day in length.

ARTIFICIAL FISHERY

* A fishery which is maintained entirely through plantings of hatchery-reared fish in order to provide angling opportunities.

BAIT-FISH

* Any member of the minnow family Cyprinidae, except carp and goldfish; the mudminnow family Umbridae; the stickleback family Gasterosteidae; the trout-perch family Percopsidae; the sculpin family Cottidae; the genus Leucichthys of the whitefish family Coregonidae and the darter subfamily Etheostomatinae.

CHATHAM DISTRICT

* The Chatham administrative district of the Ontario Ministry of Natural Resources comprises the lands and waters of Lambton, Kent and Essex counties and the adjacent waters of Lake Huron, Lake Erie and Lake St. Clair.

COARSE FISH

* Fish species which are not normally sought by recreational anglers and are not marketed commercially. This commonly includes fish from the families Catostomidae (suckers), Gadidae (cods) and Sciaenidae (drums).

COLDWATER FISH COMMUNITY

* Fish populations comprised primarily of the families Salmonidae (trout, salmon and whitefish), Gadidae (burbot) and Clupeidae (herrings).

COMMERCIAL FISH

* Commercial fish refers to those species captured from Lake Huron-Lake Erie-Lake St. Clair waters, under authority of a licence, and marketed for human consumption. The most common commercial fish species in the Chatham District are walleye, smelt and yellow perch.

CRITICAL FISH HABITAT

* Areas in the aquatic environment that a particular fish species is dependent upon for either spawning, rearing young or feeding.

CURRENT POTENTIAL YIELD

* The theoretical maximum yield that can be taken annually without exhausting the compensatory reserve of a fish community. The term is analogous to maximum sustainable yield, maximum equilibrium yield and theoretical yield.

EXOTIC FISH SPECIES

* A fish species which is neither native nor has become naturalized

or self-sustaining in waters within the Province of Ontario.

FISH COMMUNITY

* A combination of different fish species living and interacting together in the same body of water.

OBJECTIVE

* A quantifiable and attainable end which is to be achieved.

PACIFIC SALMON

* Pacific salmon includes coho salmon, chinook salmon, kokanee salmon, pink salmon and any member of the genus Orchorhynchus.

PROJECTED USE

* The amount of use anticipated in a particular component of the fisheries resouce by the year 2000.

PROJECTED YIELD

* The projected yield represents the estimated fisheries yield at the year 2000 and is based upon changes in fish stocks as well as realizing a proportion of the potential yield from waters currently rated as under-producing.

REHABILITATION

* This term may be applied to both fish populations and fisheries habitat. In both instances rehabilitation denotes efforts to enhance or restore a degraded or stressed situation to its original condition.

SMELT FISHING DAY

* One recreational smelt fishing trip not exceeding one day in length.

SOUTHERN ONTARIO

* The southern Ontario planning region includes the following districts: Algonquin Park, Aylmer, Brockville, Cambridge, Carleton Place, Chatham, Cornwall, Huronia, Lindsay, Maple, Napanee, Niagara, Owen Sound, Parry Sound, Pembroke, Simcoe, Tweed and Wingham.

SOUTHWESTERN REGION

* The Southwestern administrative Region of the Ontario Ministry of Natural Resources comprises the ministry's administrative districts of Chatham, Wingham, Aylmer, Owen Sound and Simcoe.

SPORT FISH

* Top predator fish species which are sought and may legally be taken by angling. In the Chatham District this usually includes fish from the families Salmonidae (trout and salmon), Percidae (walleye and perch), Esocidae (pike and muskellunge) and Centrarchidae (basses).

STRATEGY

* Planned actions or measures designed to achieve a desired end.

TACTIC

* A specific method designed to achieve one or more strategies.

TARGET

* A quantifiable end to be achieved or completed by a specific date.

TRIPLOID SALMON

* Salmon having a triple rather than double chromosome alignment which renders them incapable of reproduction but very capable of attaining large body size.

UNDER-PRODUCING WATERS

* Lakes and/or streams which, for some reason, have been withdrawn from fish production or are not producing at their estimated biological potential.

WARMWATER FISH COMMUNITY

* Fish populations comprised primarily of the family Centrarchidae (basses). Esocidae (pike and muskellunge) and Percidae (perch and walleye).

A GUIDE TO THE USE OF ABBREVIATIONS

A number of abbrevations have been used throughout the text of this document, as follows:

CFIP Community Fisheries Involvement Program

COSEWIC Committee on the Status of Endangered Wildlife in Canada

DLUG District Land-use Guidelines

GLFC Great Lakes Fisheries Commission

IJC International Joint Commission

MAF Ontario Ministry of Agriculture and Food

MOE Ontario Ministry of the Environment

MNR Ontario Ministry of Natural Resources

MTR Ontario Ministry of Tourism and Recreation

SOCPS Southern Ontario Co-ordinated Program Strategy

SPOF Strategic Planning For Ontario Fisheries

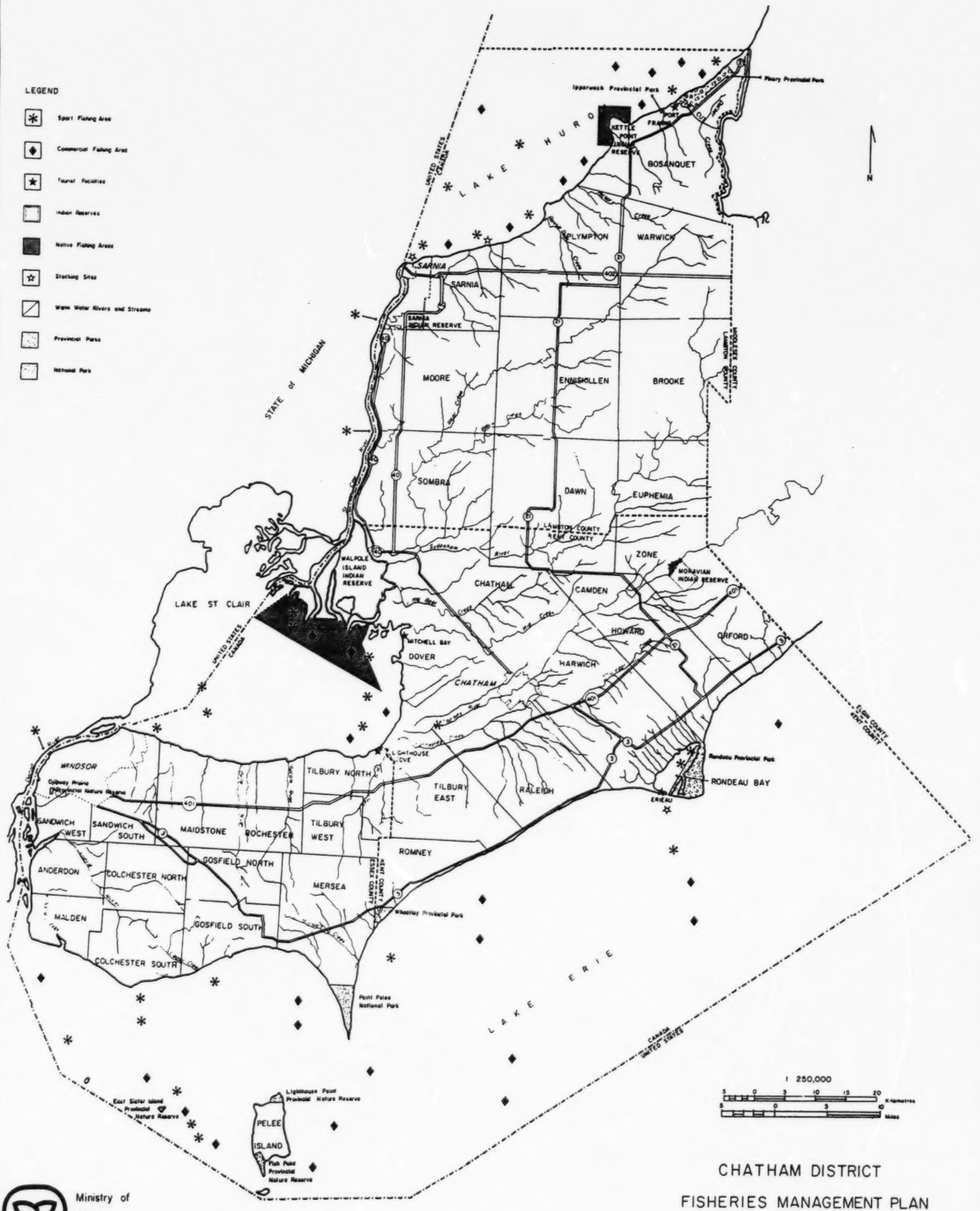
APPENDIX 1 SUMMARY OF FISHERIES RESOURCE DATA

	Inland Waters			Great Lakes			
	Warmwater Rivers and Streams	Rondeau Bay	Total Inland Waters	Lake Erie	Lake St. Clair	Lake Huron	Total All Waters
Total Surface Area (Ha)	2,969.7	2,700	5,669.7	586,500	80,000	97,000	769,169.7
Estimated Total Projected Yield (Kg/Yr.)	89,089.5	30,288	119,377.5	9,207,000	615,081	491,758	10,433,216.5**
Allowable Yield by Species* and Species Assemblage (Kg/Yr.)							
Yellow Perch		2,335		2,382,000	45,360	30,000	2,459,695
Smelt		-		2,284,000	-	-	2,284,000
Walleye		210		2,001,000	90,720	135,240	2,227,170
White Bass/Perch		102		867,000	15,876	-	882,978
Freshwater Drum		744		150,000	90,720	-	241,464
Lake Whitefish		-		-	-	18,818	181,818
Carp		-		-	158,760	-	158,760
Salmonids		-		10,000	-	58,100	68,100
Catfish/Bullhead		357		2,000	61,236	-	63,593
Bait-fish	1,460	-		45,000	2,268	12,800	61,528
Suckers		-		-	45,360	-	45,360
Smallmouth/Largemouth Bass		7,030		10,000	10,886	17,400	45,316
Northern Pike/Muskellunge		7,453		500	18,144	2,900	28,997
Crappie/Rock Bass		6,372		1,000	11,340	6,300	25,012
Bluegill/Pumpkinseed		4,569		-	14,062	-	18,631
Chub		-		-	-	10,000	10,000
Sturgeon		-		-	4,990	-	4,990
Other		1,115		862,500	45,360	37,200	946,175
Unrecorded		-		592,000	-	-	592,000
Total		30,288		9,207,000	615,081	491,758	10,345,587

* Allowable yield is a division of projected yield by species.

** Total exceeds total of individual species as the warmwater rivers and streams component could not be partitioned to species other than bait-fish.

MAP 2: FISHERIES BACKGROUND INFORMATION, CHATHAM DISTRICT



CHATHAM DISTRICT

FISHERIES MANAGEMENT PLAN

1987

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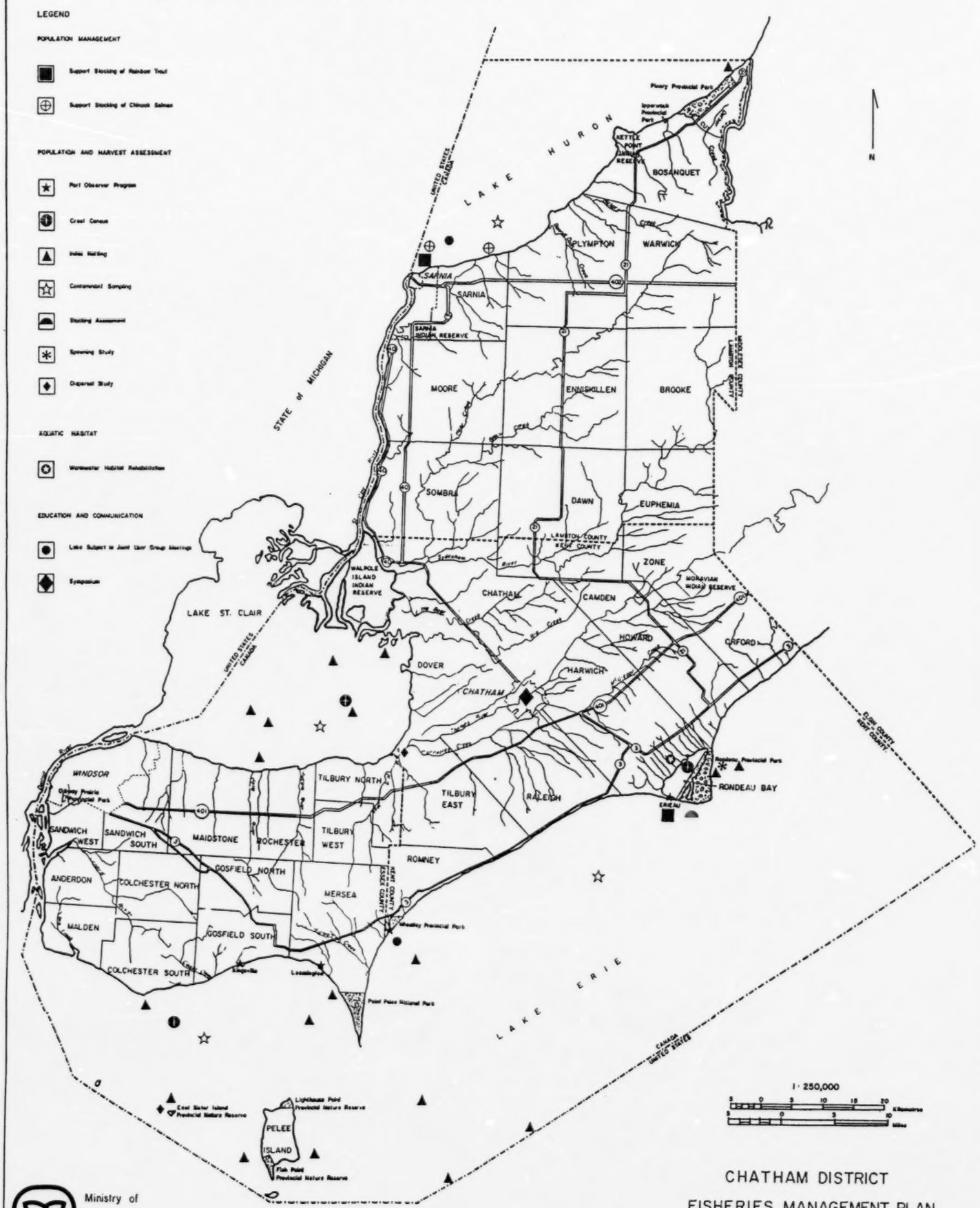
Ontario

MAP 3: FISHERIES MANAGEMENT IMPLEMENTATION SCHEDULE, CHATHAM DISTRICT, 1987 - 1991 (BASED ON EXISTING FUNDING)



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CHATHAM DISTRICT
FISHERIES MANAGEMENT PLAN
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MAP 4 : FISHERIES MANAGEMENT IMPLEMENTATION SCHEDULE, CHATHAM DISTRICT, 1987 - 1991 (REQUIRES ADDITIONAL FUNDING)

CHATHAM DISTRICT
FISHERIES MANAGEMENT PLAN
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